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Natural History of Victoria.

PRODROMUS

OF THE

ZOOLOGY OF VICTORIA;

OR

FIGURES AND DESCRIPTIONS OF THE LIVING SPECIES OF ALL CLASSES

OF THE

VICTORIAN INDIGENOUS ANIMALS.

DECADE XVI.

BY

FREDERICK McCOY, C.M.G., M.A., Sc. D. Cantab., F.R.S.,

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M DCCC LXXXVIII.

ADVERTISEMENT.

It having been considered desirable to ascertain accurately the natural productions of the Colony of Victoria, and to publish works descriptive of them, on the plan of those issued by the Governments of the different States of America, investigations were undertaken, by order of the Victorian Government, to determine the Geology, Botany, and Zoology of the Colony, to form collections illustrative of each for the public use, and to make the necessary preparations for such systematic publications on the subject as might be useful and interesting to the general public, and contribute to the advancement of science.

As the geological and botanical investigations have already approached completion, and their publication is far advanced, it has been decided now to commence the publication of the third branch completing the subject, namely, that of the Zoology or indigenous members of the different classes of the animal kingdom.

The Fauna not being so well known as the Flora, it was a necessary preliminary to the publication to have a large number of drawings made, as opportunity arose, from the living or fresh examples of many species of reptiles, fish, and the lower animals, which lose their natural appearance shortly after death, and the true characters of many of which were consequently as yet unknown, as they had only been described from preserved specimens. A Prodromus, or preliminary issue, in the form of Decades, or numbers of ten plates, each with its complete descriptive letterpress, will be published, of such illustrations as are ready, without systematic order or waiting for the completion of any one branch. The many good observers in the country will thus have the means of accurately identifying various natural objects, their observations on which, if recorded and sent to the National Museum, where the originals of all the figures and descriptions are preserved, will be duly acknowledged, and will materially help in the preparation of the final systematic volume to be published for each class when it approaches completion.

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M DCCC LXXXVIII.

PREFACE.

THIS sixteenth Decade gives an illustration, of the natural colors of life, of the beautiful species of Monitor Lizard, *M. Gouldi*, from the warmer latitudes of the colony, allied to the large Lace Lizard, or so-called Iguana, *Hydrosaurus varius*, figured on our Plate 41, of the districts nearer the Southern coast.

The next two plates illustrate two genera (*Pygopus* and *Delma*) of those extraordinary Snake-shaped Lizards without feet, popularly supposed, both by the aborigines and settlers, to be highly poisonous snakes, although perfectly harmless.

Plate 154 gives a figure from the recent specimen, of the natural colors, of the rare gigantic Mackerel, the *Cybium Commersoni*, of which only one example has been found on our coast.

The next plate illustrates another fine species of large, food fish, one of the *Pelamyds*, nearly allied to one from Japan, but which I have named *Pelamys Schlegeli*, to recall that fact, and on account of differences which I have published.

The next three plates illustrate rare and interesting Polyzoa from our coast, the specimens and descriptions of which Mr. MacGillivray has given for the Museum and this work.

Plate 159 illustrates the common Sydney Craw-fish, *Palinurus Hügeli*, showing the colors of life for the first time; one of the rarest crustacea of our coast. This is replaced in Victoria by the Southern Spiny Lobster or "Common Melbourne Craw-fish,"

Palinurus Lalandi, figured in our fifteenth Decade, which, I have no doubt, is identical with the species of the Cape of Good Hope and New Zealand, but not recorded from New South Wales or any place much north of Victoria. By comparison with South African specimens, I have confirmed my previously published opinion of the identity of the South African and Victorian species.

The last plate illustrates, what I believe to be, a local variety of the "Murray Spiny Lobster" or large Murray Cray-fish, *Astacopsis serratus*, found abundantly in the Yarra and the streams flowing into it. I have given the name *Yarraensis* to this variety, which, from its small size and bright blue color, is very unlike the large northern Murray form, the illustration being desirable, as the majority of the fishes and other inhabitants of the Murray are different from those found in the rivers running southwards, as the Yarra does.

The succeeding Decades will illustrate as many different genera as possible, and will deal first, usually, with species of some special interest, and of which good figures do not exist, or are not easily accessible.

FREDERICK McCOY.

22nd June, 1888.*

* Pressure of other business at the Government Printing Office, and the removal to new building, have delayed the publication of this Decade.

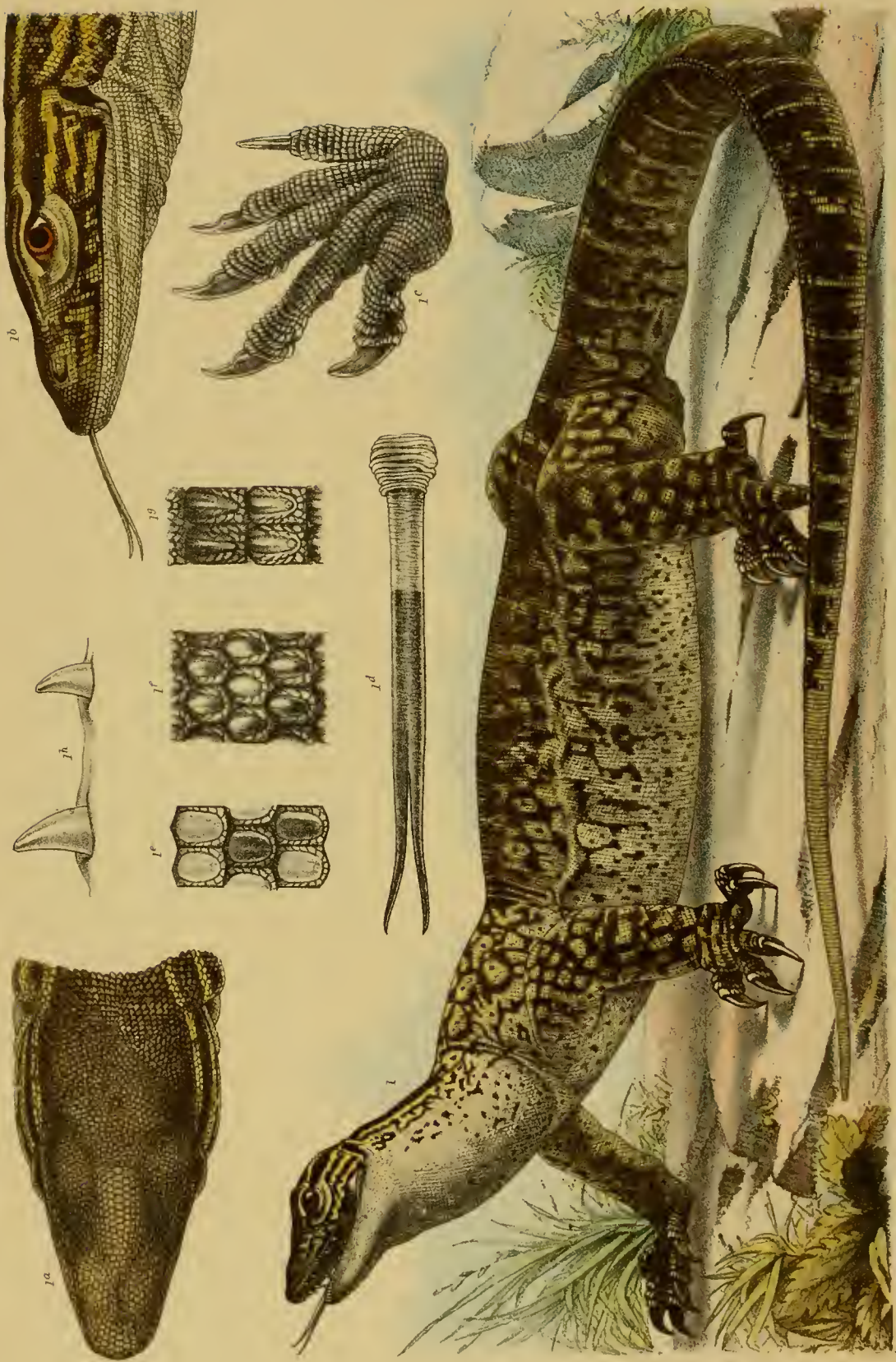
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PLATE 151.

MONITOR GOULDI (GRAY).

GOULD'S MONITOR LIZARD.

[Genus MONITOR (GRAY). (Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Section Squamata. Sub-order Leptoglossæ. Tribe Cyclosaura. Family Monitoridæ.)

Gen. Char.—Body fusiform, covered with small, quadrate scales in small, transverse bands on back and belly, tubercular, each on upper surface surrounded with rows of small granules; one small, transverse fold at base of neck, in front of shoulders; tail long, tapering, compressed, with whorls of small scales, and a double scaly keel above. Head moderate, covered with very small, polygonal plates; tongue very long, narrow, slender, flattened, deeply forked, with two horny, cylindrical tips at distal end, and lodged in a cylindrical sheath at base; eyes diurnal, pupil circular, with two valvular eye-lids; scales over the eye equal; ear-drums large, with simple edges; legs strong, for walking; toes, five on each foot, elongate, unequal, compressed, strong, with large curved claws; thighs without pores; no preanal pores; nostrils about half-way between tip of snout and front edge of eye. Teeth compressed, pointed, distant, smooth, anchylosed to inner edge of jaw-bones by outer surface.]

DESCRIPTION.—Body elongate, ovate, slightly depressed; neck long, cylindrical. Head ovate, flattened and subtriangular above; sides in front of eye flattened, vertical, nearly at right angles with upper surface, tapering with straight sides to narrow rounded muzzle. Nostrils longitudinally triangular, hind edge slightly nearer to tip of snout than to eye; plates on eye-lids, sides, and top of head, very small, sub-equal, polygonal, smooth; vertex plate* rounded, about three times the length of adjacent plates. Tail about one-third longer than the body, moderately compressed laterally; double keel formed of two rows of triangular scales, commencing nearly at base, greatest height at about one-fourth the length of the tail from the base, each scale a little longer than its vertical, highest posterior end, and having other scales on the sides, gradually passing into the size and shape of the ordinary scales of the sides of the tail. *Teeth* small, smooth, compressed, the sharp anterior and posterior edges nearly smooth, moderately arched backwards, far apart, about six in upper and about four or five in lower jaw. *Scales* of upper surface of neck, body, and limbs formed of a convex, longitudinally oval, tubercle in middle, surrounded by several rows of small granules; more elongate, keeled, and triangular on tail, with the rows of granules chiefly towards the distal end; on belly, flat, oblong, a little longer than wide, with about one row of small granules round each. *Color:* Above, brownish-black, with seventeen or eighteen transverse rows of irregular, rounded or quadrate, pale-yellow spots, about from three to ten scales long, ocellated or with black centres over shoulders and on sides, plain on middle of back, more definite and rounded on upper sides of limbs. About 23 narrow, transverse, yellow bands on tail, from one to three scales wide, the black intervals from five to ten scales wide, terminal fourth of tail plain pale-yellow; under-side of neck, belly, tail, and limbs pale-yellow, with small, scattered, quadrate, black spots; throat clouded with pale-blue, without black spots; top of head plain brownish-black; sides of head mottled, yellow and black; yellow on upper eye-lid extending backwards as a distinct narrow streak beyond and above the ear; yellow of lower eye-lid extending as a broader, distinct, narrow streak over top of ear nearly to shoulder;

* Probably indicating the position of the "Pineal Eye."

nape black, slightly freckled with small yellow spots. Iris orange. Tongue dull-blackish-blue or lead-color; sheath and base cream-color, like interior of mouth. Toes strong, the scales arranged in transverse, angular, prominent ridges below; soles with small, granular scales irregularly disposed; claws very large, strong, curved downwards, pointed.

MEASUREMENTS OF AVERAGE SPECIMEN.

	Feet.	Ins.	lines.
Total length	3	1	0
Length of tail	1	10	0
„ of head	0	2	6
„ of gape	0	1	11
„ from tip of muzzle to anterior edge of nostril ...	0	0	5½
„ from tip of muzzle to anterior edge of orbit	0	1	3½
„ from tip of muzzle to ear	0	2	5
Diameter of orbit	0	0	5
Width of forehead between eyes	0	1	0
Length from tip of snout to shoulder	0	6	6
„ of inner toe of anterior foot	0	0	5
„ of claw of ditto	0	0	6
„ of second toe	0	0	6
„ of claw of ditto	0	0	6
„ of third toe	0	0	9
„ of claw of ditto	0	0	6
„ of fourth toe	0	0	10
„ of claw of ditto	0	0	5
„ of fifth toe	0	0	6
„ of claw of ditto	0	0	5
„ from shoulder to base of third claw	0	3	9
Girth of body	0	11	0
Length from tip of snout to hind leg	1	2	6
„ of hind leg to base of third claw	0	4	8
„ of inner toe of hind foot	0	0	5
„ of claw of ditto	0	0	5
„ of second toe	0	0	7
„ of claw of ditto	0	0	6
„ of third toe	0	0	11
„ of claw of ditto	0	0	6
„ of fourth, or longest, toe	0	1	4
„ of claw of ditto	0	0	6
„ of outer or hind toe	0	0	6
„ of claw of ditto	0	0	5½
„ of largest teeth, about middle of jaw	0	0	1¼
Height of scales of keels on back of tail	0	0	1
Granular scales in middle of back in longitudinal space of 6 lines	Nine		
„ „ „ transverse „ ...	Eight		
Flat scales in middle of belly in longitudinal space of 6 lines ...	Six		
„ „ „ transverse „ ...	Nine		

REFERENCE.—Gray, Cat., p. 12; = *Hydrosaurus Gouldi* (Gray), Ann. Nat. Hist., i., p. 394; and in Grey, Travels, v. 2, p. 422; and Er. and Ter. Rept., t. 3.

This is a smaller, much more beautiful, and rarer Lizard than the Lace Lizard, or so-called Iguana or Coast Lizard (figured on our Plate 41), and is only found in the north-west part of the colony, in the hot mallee-scrub country, where it is common, far away from water, running swiftly about the herbage, and sheltering in holes in the ground. When kept in confinement it does not

attempt to bite, but hisses loudly when much vexed; at other times giving a gentle snuffling sort of cough, such as babies emit before they are weaned. Like many other Lizards, the skin forms longitudinal wrinkles along the sides when quiet, but when irritated it inflates the skin of the body, swelling to a considerably larger size than before, and then the wrinkles disappear.

In habits this Lizard is much less arboreal, as Mr. Kershaw informs me, than the *Hydrosaurus varius*, or Lace Lizard, the latter always endeavouring to escape up a tree when alarmed, while the present species keeps on the ground and escapes into holes in the earth. The *Hydrosaurus* is a good swimmer, but this *Monitor* is most common in waterless districts. It is much less timid or inclined to escape, and is much less vicious in the use of its teeth than the Lace Lizard. M. Boulanger merges the sub-genera *Hydrosaurus* and *Monitor* in *Varanus*, but the difference in habit seems to give additional importance to the small structural differences, and I therefore prefer to retain them for the present.

The specimen figured is from Kewell, north of Murtoa, near Horsham, one of several obtained through the good offices of Mr. Jos. Hill, of that district.

Explanation of Figures.

Plate 151.—Fig. 1, average specimen, half natural size. Fig. 1*a*, top view of head, natural size, showing the small, rounded vertex plate, small plates of crown of head, and still smaller ones over orbit. Fig. 1*b*, side view of head, natural size. Fig. 1*c*, under-side of anterior foot, natural size, to show granular palm, and prominent, transverse ridges of scales on toes. Fig. 1*d*, tongue, natural size, with sheath at base. Fig. 1*e*, scales of belly, magnified four diameters. Fig. 1*f*, scales of back, magnified four diameters. Fig. 1*g*, scales of tail, magnified four diameters. Fig 1*h*, teeth, magnified five diameters.

Frederick McCoy.

ZOOLOGY OF VICTORIA
(Reptiles)

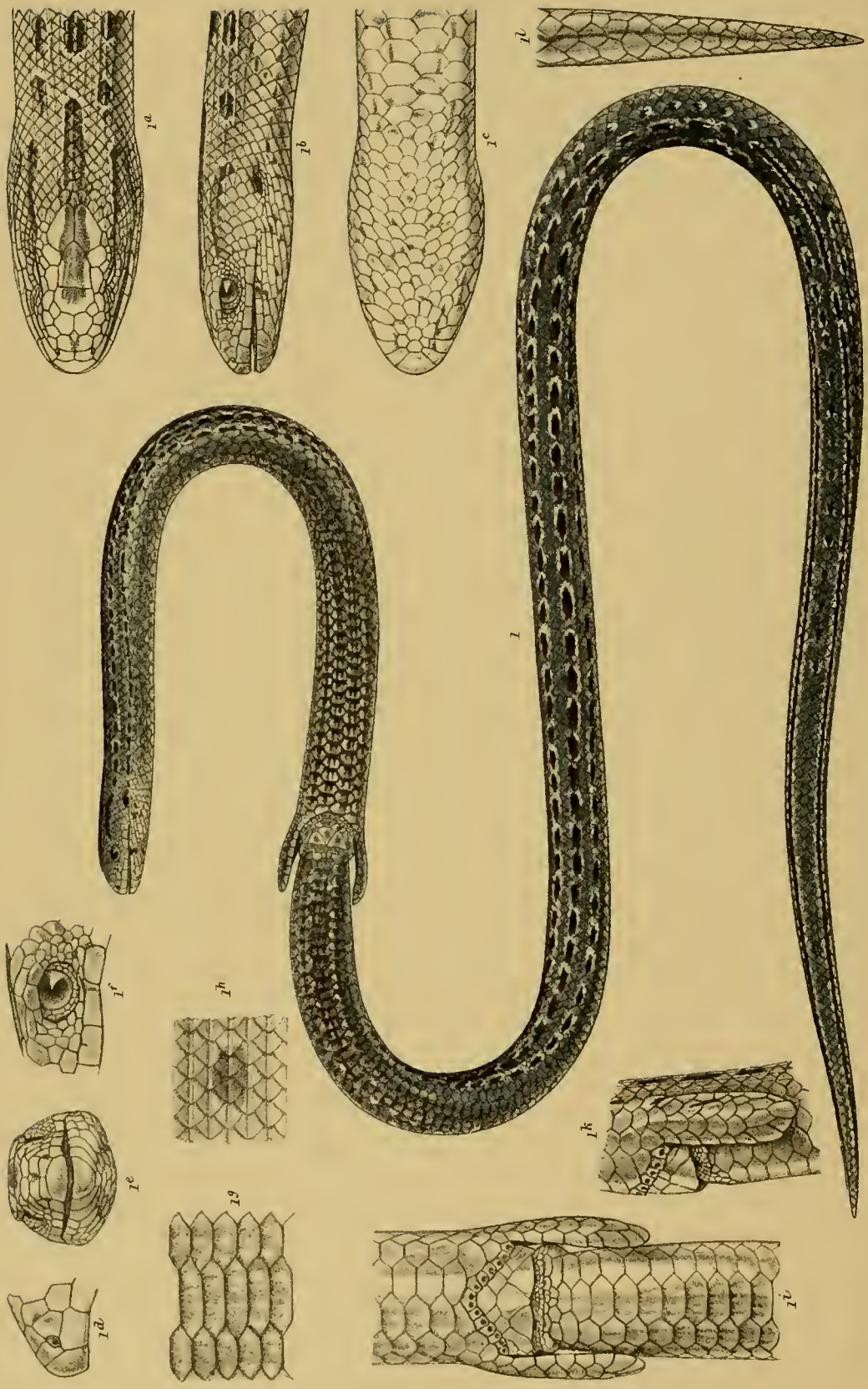


PLATE 152, AND PLATE 153 FIG. 2.

PYGOPUS LEPIDOPUS (LACÉP. SP.).

THE PYGOPUS.

[Genus PYGOPUS (FITZINGER) = BIPES (CUV.) = HYSTEROPUS (DUM. AND BIB.). (Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Sub-order Leptoglossæ. Tribe Geissosaura. Family Pygopidæ.)

Gen. Char.—Body snake-like, long, slender, cylindrical, tapering. Anterior legs none; posterior legs represented by a flat, elongate, ovate, scaly appendage on each side of base of tail, not divided into toes externally, but containing four rows of toe-bones. Pre-anal pores distinct, large, numerous. Head short, truncate, rounded. Plates: of head large; rostral plate large. Nostrils lateral, circular, in lower angle of transverse band-like nasal plate; two or more pairs of supra-nasal or fronto-nasal plates, like the nasals, over them; inter-nasal or pre-frontal plate large, with elongate frontal plate behind it; two large parietal plates and one small occipital plate behind the posterior ends of the parietal plates; two or three supra-ocular, or temporal, plates on each side. Ears: drums exposed, ovate, distinct, oblique. Pupil nearly circular, very broad, oval, erect. Eye-lids circular, rudimentary, scaly, immovable. Teeth conical, pleurodont, simple in jaws, none on palate, which has a wide longitudinal furrow. Tongue broad, flat, thin, scaly in front, velvety behind, rounded and notched at tip. Scales of back sub-hexagonal, keeled; ventral shields hexagonal, broad, two middle rows broadest; sub-caudal plates broad, in three rows, the middle one broadest. Scales of throat small. Parietal bones separate, premaxillary single, produced backwards between the nasals. Orbit separated from frontal by junction of pre- and post-orbitals. Australia.]

DESCRIPTION.—Head sub-trigonal, narrow and rounded in front; eye a little nearer tip of snout than ear; canthus rostralis obtuse; rostral plate large, about twice and a half as wide as long, varying from pentagonal, where the middle of the upper edge is raised in an angle between the nasals, to quadrangular where the upper edge is straight; two transversely oblong nasal plates and two pairs of nearly similar supra-nasal plates over them; nostrils round, in lower outer angle of nasals, surrounded by first labial, nasal, and freno-nasal; two or three rows of irregular polygonal plates on frenal region between nostril and eye; one (or two) small fronto-nasal plates on each side in front of temporal plate; temporal, or supra-ocular, plates three, the anterior largest, and posterior smallest; inter-nasal or anterior frontal large, heptagonal, a little wider than long, and wider than the frontal, with which its posterior edge forms a transverse suture, length about equal to the two supra-nasals; frontal sub-pentagonal, widest in front, sides indented by the temporal plates, about two-thirds the width of anterior frontal, and about one-third longer than wide; parietal plates forming nearly an equilateral triangle, notched in front for posterior end of frontal, and behind for a very small occipital. (Sometimes a narrow, posterior pair of parietal-like plates, as in Plate 153, Fig. 2*b*.) Chin-plate large, as wide as the rostral; seven sub-equal, oblong upper labial plates (separated from orbit by a row of small plates), the first (Plate 153, Fig. 2*a*), or first and second (Plate 152, Fig. 1*b*), extending downwards on side of chin. Eye-lids with two rows of very small scales. Pre-anal pores sub-tubular, usually six (five to seven) on each side of a triangle in front of five to ten large, irregular unequal, pre-anal, plates. Scales of back flat, sub-hexagonal, each with a very narrow, sharply defined, thread-

like keel, about one-seventh the width of the scale, in twelve rows at middle of body, keeled, and eleven rows without keels on sides and belly; keels of body continuous, of tail alternate; number of abdominal plates from throat to vent usually about 78 or 80. Posterior leg-lobes broad, rounded at tip, with four rows of scales on outer side, the length about four-fifths the length of head in males, or equal to nearly five of the scales of the sides in front; twice as long as wide; only as long as from tip of snout to anterior edge of eye in females. *Colors:* Very variable; ground color whitish below, lavender-blue above, with a brown tinge often on the outer skin; some specimens (as our Plate 153, Fig. 2) have only a few, irregular, dark specks or none on the sides and upper surface, and the under-side plain-yellowish-white; while others (as our Plate 152, Fig. 1) have a long, divided, black, white-edged patch on the top of the head, continued along midline of back as a series of oblong, black spots with narrow white edges, and one or two lines of similar, oblong, quadrangular, black, white-edged spots on each side, and the whole under surface netted or marbled with the lavender-blue of the back. I have one specimen with the former coloring on the anterior half of the body and the rows of white-edged black spots on the hinder half, and there are many subordinate variations of each, showing clearly that the specimens, apparently so different in this respect, do not differ in any other. A black vertical spot from the eye across both lips is the most constant. *Measurements:* From tip of snout to base of tail, 6 ins. 6 lines; from base of tail to tip of tail, 1 ft. 4 ins. 6 lines; length of head from tip of snout to ear, 8 lines; length of leg-flap, $5\frac{1}{2}$ lines, width, 2 lines.

REFERENCE.=*Bipes lepidopodus*, Lacép. Annal. du Musé. d'Hist. Nat., v. 4, t. 45, f. 1; = *Pygopus lepidopus*, Merrem. Tent., p. 77; = *Hysteropus Novæ Hollandiæ*, Dum. et Bib. Erpt. Gen., v. 5, p. 828, t. 55 + *Pygopus squamiceps*, Gray Cat. Liz., p. 68, Er. and Ter. t. 8, Fig. 3.

These curious creatures are more like snakes than lizards in appearance, from the form of the body, absence of true feet, and having scales above, and larger abdominal and sub-caudal shields below. The resemblance to snakes rather than to lizards is anatomically suggested by the simplicity of the lower jaw bones on each side; the angular, supra-angular, and articular bones being anchylosed. The transverse row of pre-anal pores is like that in the *Amphisbenæ*. The two sides of the lower jaw being fixed in front, the external ears, eye-lids, and other structural characters show that they have no affinity with snakes, but are true lizards.

The spotted specimens often agree in coloring and marking with Dr. Gray's illustration of *Lialis Burtoni*, and the plainer ones agree with his *P. squamiceps* and Duméril's figure in coloring; but there are many intermediate specimens, clearly proving the character to be of no specific value; in some specimens, several of the oblong spots are confluent, forming short streaks.

The scales and plates of the head are so variable that I have no doubt Dr. Günther is right in uniting Dr. Gray's *P. squamiceps* to *P. lepidopus*. I have several specimens with one small plate between the inner ends of the posterior supra-nasals, as in our Plate 152, Fig. 1*a*, and some in which there are two, one between the anterior supra-nasals and one between the posterior supra-nasals; and one specimen with three in a median row, from one being between the nasals also; and in another the supra-nasal plates are each doubled; while the greater number of specimens have no intercalated plates in midline, and only the normal number of plates, as in our figure, Plate 153, Fig. 2*b*. In one specimen there are two, small inter-parietal plates between the anterior ends of the parietals; in another of the var. *squamiceps* there are two fronto-nasals on each side, as well as three pairs of supra-nasals and four intercalary plates in midline between the inner ends of them and the nasals.

The original figure of Lacépède in the Annals du Muséum shows the leg-flaps nearly in the middle of the length, and Gray's *P. squamiceps* has the tail only half the length of the anterior part, while in Duméril and Bibron's figure the tail is twice and a half as long as the part before the flaps, as in our figure, Plate 152, Fig. 1. This latter is the correct proportion of the perfect animal, but, like the English Slow-worm, it is so fragile during life that it easily loses a portion of the hinder part of the body; which lost part is reproduced quickly, but in such a way that the cautious observer can easily see when he is dealing with an individual specimen to which such a common accident has happened, by noting some slight difference in color and the texture of the scales, accompanied by a greater or less diminution of size from the true proportion. This may be clearly seen in Lacépède's figure (although he does not seem to have noticed it), in which the engraver has suddenly stopped the lines representing the keels of the scales at a point where, no doubt, the fracture took place, and beyond which the tail is a re-grown one of less than the original length. Similarly, the lithographer in Gray's figure of the very short-tailed *P. squamiceps*, clearly shows, by the difference of treatment, where the new growth has reproduced the tail so much too

short—again not noticed by the author. Our figure of the plain-colored variety on Plate 153, Fig. 2, also shows a slight difference of color and characters of the scales where a fracture during life and reproduction gives apparently yet another proportional length of tail.

Common, particularly in the warmer northern part of the colony.

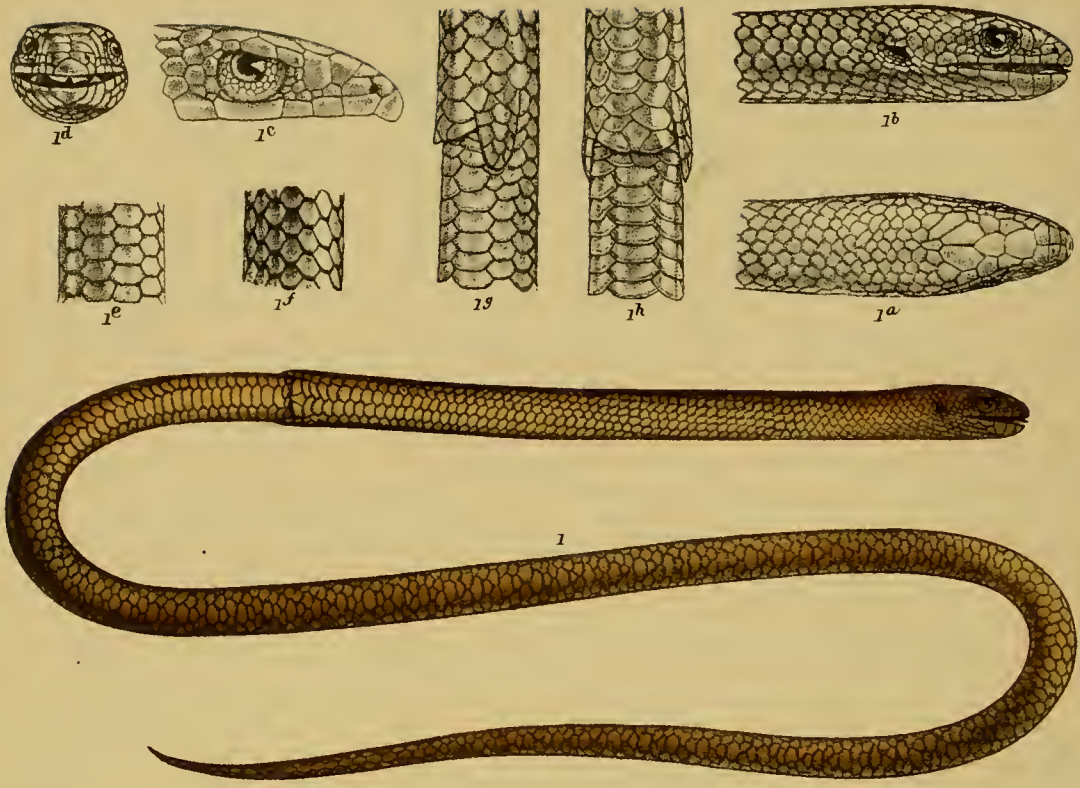
EXPLANATION OF FIGURES.

PLATE 152.—Fig. 1, fine, perfect, male average specimen, natural size. Fig. 1*a*, top of head, magnified two diameters, to show the form and proportion of cephalic plates (with one abnormal median plate between the inner ends of the posterior supra-nasals). Fig. 1*b*, side view of head, magnified two diameters, showing the side plates of head, the ear, and the keeled scales of the upper surface, and smooth scales of lower side. Fig. 1*c*, under-side of head, magnified two diameters. Fig. 1*d*, side view of snout, magnified four diameters, to show more clearly the relative position of nostril and surrounding plates. Fig. 1*e*, front view of head, magnified two diameters, showing the rostral and mental plates. Fig. 1*f*, scaly eye-lid and plates about orbit, magnified four diameters. Fig. 1*g*, Sub-caudal scales of middle and adjacent rows, magnified three diameters. Fig. 1*h*, scales of back, to show the narrow, definite, thread-like keel, magnified three diameters. Fig. 1*i*, under-side of end of abdomen and base of tail, magnified two diameters, to show pre-anal pores and adjacent scales. Fig. 1*k*, side view of same part, magnified two diameters, to show scaling of posterior feet. Fig. 1*l*, under-side of extremity of tail, magnified two diameters.

PLATE 153.—Fig. 2, female, variety, with plain coloring, natural size (the shortness of the tail being due to its having been reproduced after fracture). Fig. 2*a*, side view of head, magnified two diameters. Fig. 2*b*, top of head, showing some irregular variations in size and shape of plates, magnified two diameters. Fig. 2*c*, front view of head, magnified two diameters. Fig. 2*d*, side of snout, magnified four diameters. Fig. 2*e*, scaly eye-lid and adjacent plates, magnified four diameters. Fig. 2*f*, pre-anal pores, with shorter foot-flaps and adjacent scales, magnified two diameters. Fig. 2*g*, sub-caudal scales, magnified three diameters. Fig. 2*h*, dorsal scales, with narrow, definite, thread-like keel, magnified three diameters.

FREDERICK MCCOY.

ZOOLOGY OF VICTORIA
(Reptiles)



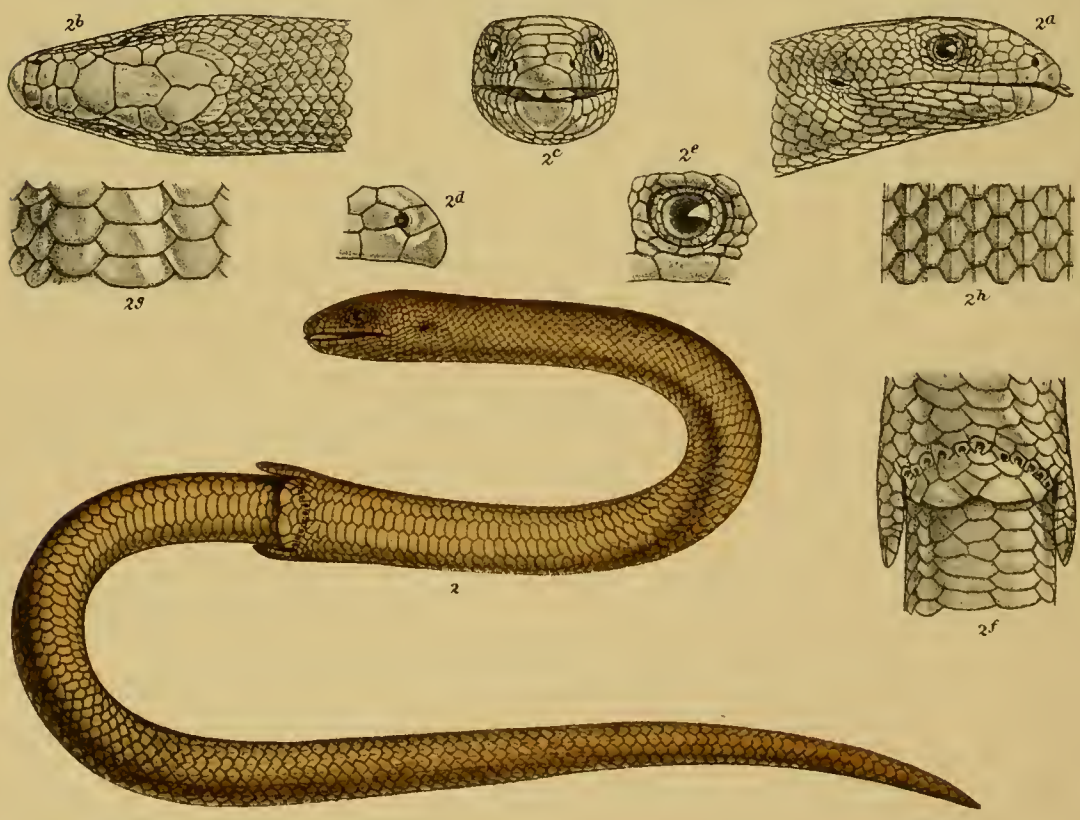


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PLATE 153, FIG. 1.

DELMA FRAZERI (GRAY).

FRAZER'S DELMA.

[Genus DELMA (GRAY). (Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Sub-order Leptoglossæ. Tribe Geissosaura. Family Pygopidæ.)

Gen. Char.—Body long, slender, tapering, snake-like; anterior limbs none; posterior limbs formed of small, flat, scaly, undivided flaps, one on each side of base of tail; pre-anal pores none; head small, ovate, with large symmetrical plates; rostral plate large; nostril in hind outer corner of transversely oblong nasal plate on each side; two pairs of transversely oblong supra-nasal, or fronto-nasal, plates, like the nasals; inter-nasal, or pre-frontal, plate large, heptagonal; frontal moderate, heptagonal, pointed behind; a pair of large parietal plates behind the frontal, and a small occipital between their posterior ends. Ears ovate, open, distinct, with simple edges. Scales hexagonal, smooth, unkeeled, small above; two rows, wider, along belly, one row of wider ones under middle of tail; eyes round, with circular, scaly, imperfect, immovable eye-lids; pupil nearly circular, broad-oval, erect. Parietal bones separate. Australia.]

DESCRIPTION.—Body and tail sub-cylindrical, very slightly flattened below, gradually tapering to a slender posterior point. Head semi-oval or sub-trigonal, sides nearly straight, converging to a bluntly-rounded, narrow muzzle, the tip of which measures to front edge of eye about as much as from posterior edge of eye to anterior edge of ear; rostral plate large, pentagonal, twice as wide as high; nasals small, transverse, quadrate, oblong, their inner ends touch, the outer end pierced by the large nostril, which is surrounded also by the first upper labial and the freno-nasal plate; naso-rostral plates transversely quadrate, inner ends touching, smaller than the nasals; fronto-nasals large, pentagonal, touching along inner edge, having freno-nasal and naso-rostral along longest front edge; inner posterior edge touching front edge on each side of inter-nasal; posterior outer edge touching a large ant-ocular or loreal plate in front of the two temporal plates; smallest outer edge touching the first of the three small frenal plates extending over the labials from the freno-nasal to a group of three or four small plates in front of the eye; inter-nasal or pre-frontal plate large, heptagonal, about as broad as long; frontal heptagonal, a little narrower and shorter than the pre-frontal, about one-third longer than wide, hind angle between parietals; two parietal plates, small, sub-pentagonal, inner edges in contact; straight, pointed posterior ends with a very small occipital plate between them; a large plate-like scale usually on each side of posterior lateral edge of parietal; upper labials five, fourth, under the eye, longest; lower labials four, first meeting under the chin behind the large trigonal mental plate; second very large, nearly meeting under throat, others small. Ear large, longitudinally-oval, slightly oblique, open, simple edged. Eye-lids covered with three rows of minute scales. Hind leg-flap small, as long as four scales of back at base, or equal to space from snout to orbit in males, shorter in females, covered with three rows of small scales, four in the middle row, placed at a distance from the ear of 65 rows of back scales. Scales of back small, sub-hexagonal, as broad as long, in fourteen to sixteen rows; belly, with two rows of from 50 to 60 pairs of larger hexagonal plates in middle, about twice as wide as long; three large pre-anal plates in a transverse row, middle one smallest; plates of under-side of tail in three rows of transversely hexagonal scales, middle row largest, nearly twice as wide as long near base, gradually becoming smaller, less transverse and irregularly arranged towards the

posterior end of tail. *Color:* Some specimens uniform light-greyish-brown, paler below; others have black, transverse patches on the snout, the middle of head coming down as a narrow, triangular mark through the eye on each cheek, and others have, in addition, a very variable number of fainter, triangular spots extending along the side where the back and belly scales meet, for a greater or less distance. *Measurements:* Tip of snout to base of leg-flaps, 3 in. 10 lines; tail, 12 in. 9 lines; tip of snout to ear, 5 lines; diameter at middle of body, 3½ lines; number of scales on middle of back in half-an-inch, 10.

Reference.—Gray, in Grey Trav. Anstral., v. 2, p. 427, t. 4, f. 3; = *Delma Grayi*, Smith Ill. Zool. S. Africa Rept., t. 76, f. 2; ? = *D. Mölleri* Lütken Vidensk. Meddel 1862, p. 296, t. 1. f. 2.

This genus mainly differs from *Pygopus* in the smooth, unkeeled scales of the body, and in the absence of the transverse row of pre-anal pores. The flaps representing the hind limbs are smaller than in that genus.

The original figure by Dr. Gray in Capt. Grey's Travels is much too short, the individual figured having obviously been broken during life, and the tail end re-grown of smaller dimensions than natural, as is very commonly seen; the apparently excessive length of Smith's figure being due to the specimen having escaped mutilation. I have no doubt that Dr Günther is quite correct in suggesting the specific identity of Gray's and Smith's species, the latter being really an Australian, and not an African, form. The greater number of the specimens found near Melbourne are of the plain uniform coloring of our figure, but I have a few with dark markings on the head and sides of neck depicted by Gray and Smith, differing in no other respect from the plain ones. One specimen in the Museum; from Newington station, in the Wimmera district, presented by Mr. Forster, of Stawell, has grown two tails, forking out from the place of previous fracture.

Explanation of Figures.

Plate 153.—Fig. 1, average specimen of plain colored variety, natural size. Fig. 1*a*, top of head, magnified two diameters, to show form of plates (large scale outside parietals divided on one side). Fig. 1*b*, side view of head and neck, showing ear, magnified two diameters. Fig. 1*c*, portion of side view of head, magnified four diameters, to show more clearly the scaly eye-lid, the large fourth labial, under the eye, the large loreal or ant-ocular plate, and other plates on the side of the head more clearly. Fig. 1*d*, front view of head, magnified two diameters, to show the rostral and mental plates, and the downward prolongation of the first and second lower labials. Fig. 1*e*, plates of under-side of belly, magnified two diameters, showing the two median rows wider than the two lateral ones. Fig. 1*f*, scales of back, magnified two diameters. Fig. 1*g*, side view of posterior end of body and anterior end of tail, to show leg-flaps, magnified two diameters. Fig. 1*h*, same part of body, magnified two diameters, viewed from below, showing the pre-anal plates with four rows of abdominal and three rows of sub-caudal plates, with their relative sizes, magnified two diameters.

Frederick McCoy.

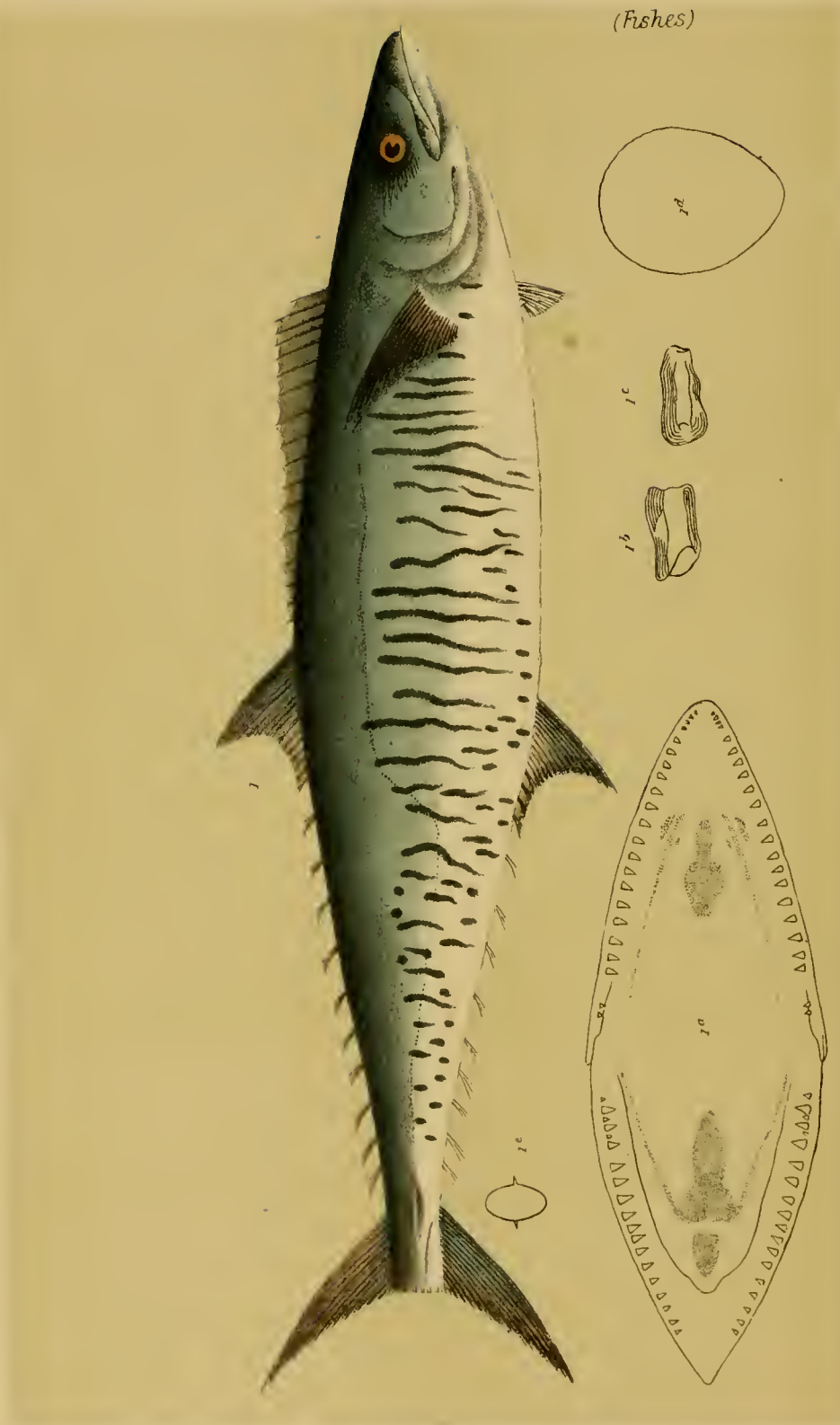

PLATE 154.

CYBIUM COMMERSONI (LACÉP. SP.).

COMMERSON'S MACKEREL.

[Genus CYBIUM (CUVIER). (Sub-kingdom Vertebrata. Class Pisees. Order Acanthopterygii. Family Scomberidæ.)

Gen. Char.—Body elongate, fusiform, moderately slender; cleft of the mouth wide First dorsal long, with rather feebly developed spines, reaching nearly to the second dorsal; seven or more finlets behind the dorsal; anal fin resembling the second dorsal in size, shape, and position, and with a similar number of finlets behind it; caudal fin moderate, forked, a strong prominent keel on each side the base of tail. Greater portion of body naked, or with very small scales, not forming distinct corselet. Teeth large, compressed, with cutting edges, lancet-shaped, on edge of both jaws, small villiform teeth on the vomer and palatine bones, similar patch on tongue. Seven branchiostegal rays. An air bladder. Indian and Atlantic Oceans.]

D. 16 + D. 1 + 16 + X.; P. 24; V. 1 + 5; A. 1 + 16 + IX.; C$\frac{1}{1}\frac{2}{7}$; L.l. 265.

DESCRIPTION.—Height of the body at end of spinous dorsal $6\frac{3}{4}$ times in total length, excluding caudal. Length of the head five times in total length, excluding caudal. Greatest depth of head rather more than three-fifths of its length. Diameter of eye rather more than one-seventh the length of the head, nearer to the snout than to hind edge of operculum. Profile of upper part of head nearly straight, sloping, surface slightly convex and smooth. Snout pointed in front, lower jaw less acute, but slightly longer, than the upper. Cleft of mouth extending to vertical of hind edge of eye. Twenty-seven sub-equal, slightly irregular, triangular teeth on each side in upper jaw, a little longer than wide. About 16, much larger and longer, in lower jaw. A few rows of scales above the pectoral, behind the head, and along the base of the first and second dorsals. Pectoral fin narrow, falcate, pointed, one-eighth the total length, excluding caudal. Ventral one-third the length of the pectoral, of one spinous and five branched rays. First dorsal commencing over base of pectoral, and extending to within a short space of the second dorsal. Second dorsal twice as high as the first, falcate, little longer than high. Anal nearly equal in size and shape to the second dorsal, its front edge a little in front of vertical from middle of second dorsal. Ten finlets behind second dorsal, and nine similar ones behind anal. Lobes of the caudal nearly equal, long and narrow. Lateral line from head slightly undulated to vertical from hind end of second dorsal, suddenly descending from thence and resuming the longitudinal direction from vertical of second finlet nearly in the middle of the body to the large prominent median keel at base of tail; two small curved ridges, one above and one below median keel. *Color:* Upper part of back purplish-blue, fading into silvery-white on lower part of sides and belly. The sides and belly marked with numerous irregular, nearly vertical, stripes and spots of a dark brownish-purple. Anterior dorsal purplish. Ventrals whitish. Pectoral, second dorsal, anal, and caudal fins bluish-black with a brown tinge. Base of pectoral whitish. Iris golden-bronze.

MEASUREMENTS.

	Ft.	ins.	lines.
Total length, excluding caudal	3	4	3
Length from tip of snout to posterior edge of operculum ...	0	8	0
Greatest depth at vent	0	7	2
Height of first dorsal	0	1	9
Length from tip of snout to origin of first dorsal	0	8	6
Length of first dorsal	0	10	2
Height of second dorsal	0	3	7
Length of first ray of ventrals	0	1	10
„ of lobes of caudal	0	5	9
„ of base of same	0	2	0

REFERENCE.—*Scomber Commersoni Lacépède*, Shaw Zool. Fish, v. 4, t. 85 = *Cybium*, id., Cuv. and Val. Poiss., v. 8, p. 165.

The specimen figured is the only example of this fine fish which has been observed on our coast; it was caught near Queenscliff in March, 1887. The example was quite fresh when our drawing was made, and the vertical stripes and spots were as distinct as shown, but Dr. Day in his "Fishes of Malabar" says they only appear after death. The body seems smooth and naked, the scales are so very minute (about ten in space of one line). I have counted the mucous pores as scales along the lateral line. The two or three rows of larger scales above the base of the pectoral fin behind the head are very conspicuous, but do not form a corselet. The villiform teeth forming patches on the vomer, palatines, and tongue are very minute.

EXPLANATION OF FIGURES.

PLATE 154.—Fig. 1, side view, one-fifth natural size. Fig. 1*a*, mouth, one-half natural size, showing the large teeth on edge of jaws and patches of minute teeth on vomer and palatine bones above and on the tongue below. Figs. 1*b* and 1*c*, scales from lateral line, about the middle of length, magnified four diameters. Fig. 1*d*, form of section behind pectoral. Fig. 1*e*, sectional origin of caudal fin, to show lateral keels.

FREDERICK McCOY.

ZOOLOGY OF VICTORIA

(Fishes)

A. Bartholomew del. et lith. Prof. McCoy direct. Steam Litho Gov.t Printing Office

PLATE 155.

PELAMYS SCHLEGELI (McCOY).

THE MELBOURNE PELAMYD.

Genus PELAMYS (CUV.). (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygia. Family Scomberidæ.)

Gen. Char.—Body elongate, ovate; cleft of mouth large; teeth large, compressed, irregular on jaws, smaller rows on palatine bones, none on vomer. First dorsal continuous, with moderately small spines reaching to the second dorsal, which is small; anal small, resembling the second dorsal; seven to nine dorsal finlets, and six or more anal finlets; caudal deeply forked; pectoral pointed; ventrals small. Thoracic scales forming a distinct corselet; a prominent longitudinal keel on each side of tail. Seven branchiostegal rays. No air bladder. Pyloric appendages branched.]

D. 19 + D. 2 + 12 + VIII; A. 2 + 11 + VI; V. 1 + 5; P. 25; C. $\frac{18}{22}$?

DESCRIPTION.—Greatest height of body about $4\frac{1}{2}$ in the length of body without caudal fin, or five times, including it. Length of head one-fourth of total length. Diameter of eye twice in length of muzzle, and three times to edge of operculum behind; slightly less than one-sixth the length of the head. The posterior end of maxillary does not quite reach the vertical of posterior edge of eye. Nine compressed, slightly inarched teeth on dentary bone, and two large ones on each side of front of lower jaw. The row of small palatine teeth, about fourteen on each side. Teeth of upper jaw much smaller than those of lower jaw. Pre-operculum with numerous thick, wavy longitudinal ridges; corselet not exceeding the tip of the pectoral in length. Lateral line with an upward, angular flexure under the sixth ray of dorsal, thence with slight undulations, largest under anal, to keel at middle of side of tail. Pectoral triangular, moderately pointed, rather less than one-eighth the length of the body, reaching as far as eighth spine of dorsal. Ventrals small, with a pointed scale at inner base of each. First dorsal commencing over anterior base of pectoral, second and third rays longest, gradually decreasing to anterior base of second dorsal. The last ray of the dorsal as counted above resembles one of the succeeding pinnules. *Color:* Back purplish-lavender-grey, becoming paler and silvery on sides of head; body, and belly, with about eleven longitudinal dark streaks running nearly lengthwise; five under second dorsal and dorsal finlets, turning upwards obliquely to dorsal edge. Fins with blackish membranes and lighter rays; the edges of the second dorsal, anal, and tips of the caudal lobes slightly yellowish. Iris pale-yellow. *Measurements:* Total length from tip of snout to end of body, excluding caudal fin, 1 ft. 8 in. Proportional measurements to length as 100: Depth of body, $\frac{22}{100}$; from tip of snout to end of operculum, $\frac{25}{100}$; to anterior edge of orbit, $\frac{8}{100}$; to posterior edge of orbit, $\frac{12}{100}$; to end of maxillary, $\frac{12\frac{1}{2}}{100}$; to base of first dorsal, $\frac{27}{100}$; to base of ventral, $\frac{31}{100}$; to base of pectoral, $\frac{26}{100}$; to end of corselet, $\frac{38}{100}$; to anal fin, $\frac{70}{100}$; to second dorsal, $\frac{58}{100}$; highest spine of first dorsal, $\frac{10}{100}$; length of pectoral, $\frac{12}{100}$; longest ventral ray, $\frac{7}{100}$; longest ray of second dorsal, $\frac{8}{100}$; longest ray of anal, $\frac{8}{100}$; longest ray of caudal lobes, $\frac{17}{100}$. Twelve scales in three lines under middle of first dorsal.

The Pelamyds differ from the Tunnies chiefly in their larger teeth. The beautiful species here figured does not agree exactly with any of those previously known. Its fin-rays are fewer than in *P. sarda*, and the color streaks are less oblique and more over the sides and belly, and the pectoral fin is larger. The *P. orientalis* of Japan, which approaches it in many respects, has, according to Schlegel's figure, a more flexuous lateral line and smaller pectoral (its length going about eight and a half in length of body, instead of considerably less than one-eighth, as in our example). The figure agrees with ours in having six anal pinnules, instead of eight, as described. (Dr. Günther gives nine, I suppose, by error, as he does not seem to have a specimen.) The longitudinal streaks in ours are more numerous, and extend more over belly, and do not conform so nearly to line of back. In all other respects, except one more ray in the first dorsal, the coincidence is so near that I think it may possibly be a variety ; but as the species of *Pelamys* and *Thynnus* are so nearly allied, I think it best to give a separate specific name. The *P. Australis* of Mr. Macleay, as described, differs in its longer snout as compared with diameter of eye, the greater backward extension of the maxillary, and fewer longitudinal streaks, as well as fewer anal fin rays.

The only specimen seen of this fish was caught in Port Phillip Bay on 19th of January, 1877.

EXPLANATION OF FIGURES.

PLATE 155.—Fig. 1, side view, about one-third natural size. Fig. 1*a*, side view of mouth, natural size, showing approximate number and size of teeth in upper and lower jaw. Fig. 1*b*, one side of lower jaw, viewed from above, natural size. Fig. 1c, one side of upper jaw, viewed from below, showing the small teeth on edge, the row on palatine bone, and two minute teeth, directed forwards, on vomer, natural size. Fig. 1*d*, the two vomerine teeth, magnified. Fig. 1*e*, scales from above lateral line near middle of fish, natural size Fig. 1*f*, ditto, magnified four diameters. Fig. 1*g*, section at base of tail, to show lateral ridges.

FREDERICK MCCOY.

#. 15b

Lagenifera
Lekythospora
Poecilospora

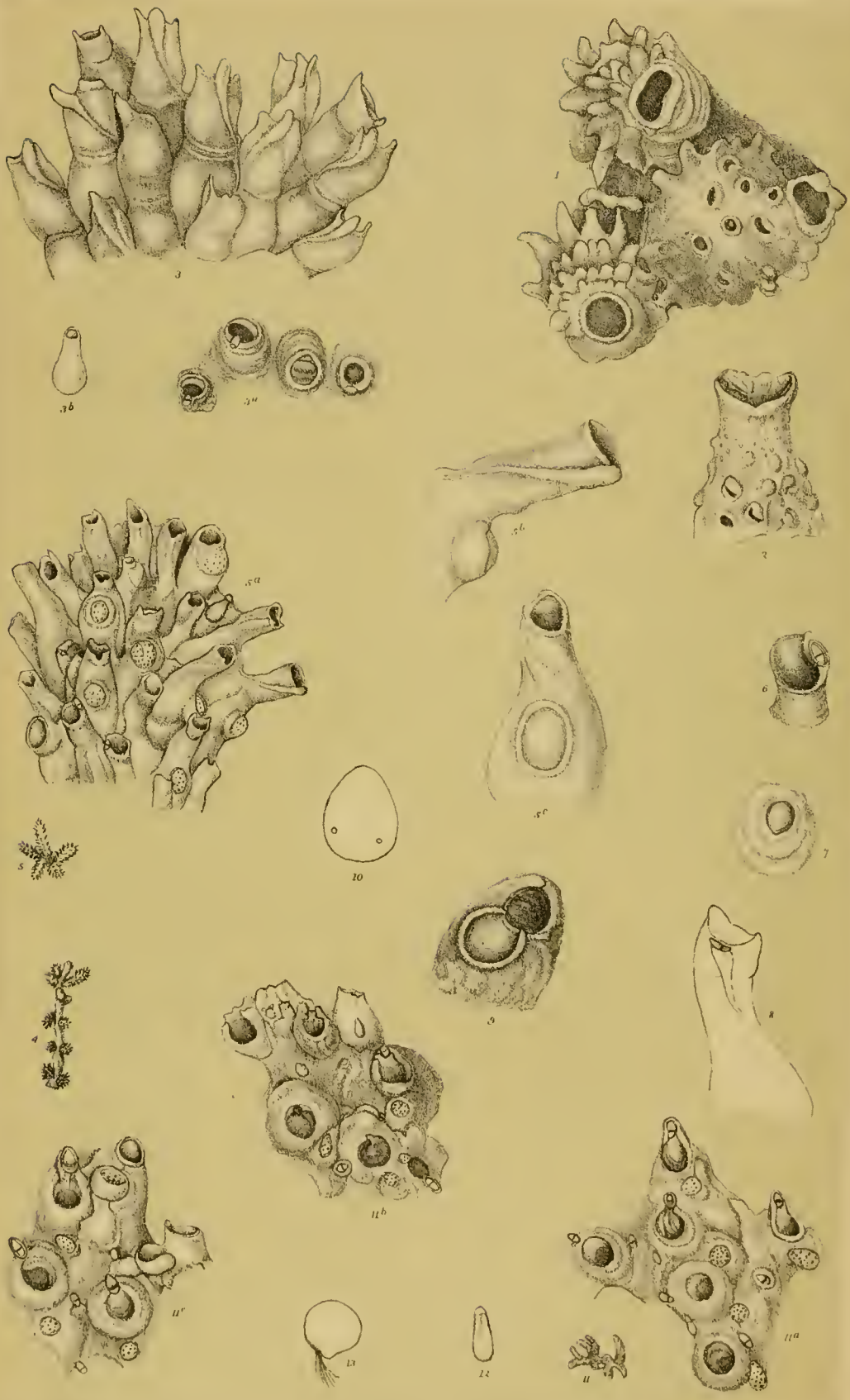

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PLATE 156, FIGS. 1 AND 2.

LAGENIPORA TUBERCULATA (McG.).

[Genus LAGENIPORA (HINCKS). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Celleporidæ.)

Gen. Char.—Zoarium encrusting; zoœcia flask-shaped; mouth sub-circular, without a sinus.]

DESCRIPTION.—Zoœcia large, flask-shaped, erect or semi-erect, surface studded with large, hollow, pointed, entire, or perforated tubercles; mouth rounded or oval, with a thickened projecting peristome.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., July 1882.

Port Phillip Heads.

In this species the zoœcia are very large and covered with numerous raised tubercles, which are entire and pointed, or not so prominent and perforated. These perforations do not seem to be, as I at first supposed, caused by attrition, as in some cases the margins are unequal, thick, and lip-like. The peristome is much produced, cylindrical, rough, with small granulations, and the circular or oval mouth has a thickened margin. I have not seen avicularia or oœcia.

EXPLANATION OF FIGURES.

PLATE 156.—Fig. 1, three zoœcia, showing pointed entire tubercles, and others open, less prominent, and almost pore-like. Fig. 2, a single zoœcium viewed laterally, to show the peristome.

PLATE 156, FIG. 3.

LAGENIPORA NITENS (McG.).

DESCRIPTION.—Zoœcia oblique or decumbent at the edge of the zoarium, more erect towards the centre, smooth; mouth in the marginal zoœcia with a tubular peristome, separated by a narrow, constricting collar; orifice with a spinous process on each side, between which is a small avicularium, carried in a semi-spiral tube, widened above and ending in a clavate projection; mouths of other zoœcia circular or sub-circular, with a small oval avicularium on one side; vicarious avicularia broadly spatulate.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov. 1886.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

Of this interesting species I have only seen the minute specimen figured, and other examples are much to be desired for more complete examination. In the simplest zoœcia there is no peristome, and there is a small avicularium at one side of the mouth. The marginal zoœcia have a projecting cylindrical peristome, produced to a point at each side, and having between these a minute avicularium on a semi-spiral tube, as is found in *Lekythopora hystrix*. In the absence of other specimens, it is difficult to say whether the avicularium of the simple mouth is carried up on the peristome of the others or whether the marginal zoœcia with the constricted peristomes are not rather comparable to the young zoœcia of some of the smaller *Celleporæ*, and the simpler zoœcia in reality older. It undoubtedly belongs to the same genus as Mr. Hincks' Madeiran *Phylactella lucida*, afterwards referred to *Lagenipora*, and his *L. spinulosa* from Queen Charlotte Island.* It is, I think, probable that *L. tuberculata* and *L. nitens* will require to be referred to different genera.

Explanation of Figures.

Plate 156.—Fig. 3, zoœcia, showing the tubular constricted peristomes, with the semi-spiral aviculiferous tubes. Fig. 3*a*, zoœcia without peristome, but with an avicularium at the side of the mouth. Fig. 3*b*, vicarious avicularium.

Plate 156, Figs. 4–10.

LEKYTHOPORA HYSTRIX (McG.).

[Genus LEKYTHOPORA (McG.). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Celleporidæ.)

Gen. Char.—Zoœcia flask-shaped or elongated, oblique or erect, crowded; primary mouth with a notch in the lower lip and a small avicularium at one side; secondary mouth with the peristome produced into a long, tubular orifice, on one side of the margin of which is the avicularium, connected with its original position by a minute semi-spiral tube; oœcia projecting from the front of the zoœcia below the mouth, covered by a chitinous or sub-calcareous plate.]

Description.—The same as that of the genus.

Reference.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Oct. 1882.

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* Ann. and Mag. Nat. History, Jan. 1884.

Port Phillip Heads.

This species is not uncommon at Port Phillip Heads, and is found growing on *Adeonella* and allied polyzoa. The zoarium attains a height of three-fourths of an inch, and is simple or more usually branched. The zoœcia are very much confused, flask-shaped, oblique or erect, the surface smooth, rough or pitted. It is extremely difficult to see the primary mouth, owing to the rapid development of the peristome. It is lofty, with a sinus in the lower lip. The peristome is produced into a long, nearly cylindrical tube, carrying a horizontal avicularium on one side, situated on the summit of a minute semi-spiral tube. The avicularium seems to be originally situated at the sides of the primary mouth immediately after the commencement of the development of the peristome, and, as the peristome grows, it is carried upwards in a semi-spiral manner. This oral avicularium is frequently absent. In some specimens there are numerous large, spatulate, vicarious avicularia. The oœcium is very peculiar, being situated below the mouth, and the front being deficient in calcareous matter and closed by a convex, lens-shaped, thick, chitinous membrane. This membrane is smooth or faintly perforated or, when older, occasionally sub-calcareous and cribriform.

Explanation of Figures.

Plate 156.—Fig. 4, branch of an *Adeonella* with several zoaria of *Lekythopora* growing on it, natural size. Fig. 5, another zoarium, natural size. Fig. 5*a*, portion of the same, magnified, showing zoœcia with peristomes and oœcia. Fig. 5*b*, lateral view of single zoœcium from the same, showing the peristome, semi-spiral aviculiferous tube, and profile of oœcium. Fig. 5*c*, another zoœcium, to show the shape of the membranous front of the oœcium. Fig. 6, orifice of peristome from another specimen, with the oral avicularium. Fig. 7, primary mouth, seen vertically. Fig. 8, outline of a peristome, with avicularium and top of tube. Fig. 9, to show the commencement of formation of an oœcium. Fig. 10, an operculum.

Plate 156, Figs. 11-13.

PŒCILOPORA ANOMOLA (McG.).

[Genus PŒCILOPORA (McG.). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Celleporidæ.)

Gen. Char.—Zoarium erect, bilaminate, branched. Zoœcia indistinct; primary month with a sinus in lower lip; peristome commencing as an elevated point with a small avicularium on the summit, finally becoming a tumid, sub-circular ring. Oœcia immersed, covered by a perforated plate.]

DESCRIPTION.—That of the genus.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov. 1886.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

Of this very curious species I have only one good specimen, for which I am indebted to Mr. Wilson, and two or three imperfect fragments. The zoarium is small, branched, bilaminate. The youngest zoœcia, and those at the margins of the branches, have one side produced into a long point, with a small avicularium on the inner surface at the summit. As growth advances, the summit disappears, and the mouth becomes surrounded by a tumid peristome, with the avicularium usually on the outer part of the ring. The pointed process, with its surmounting avicularium, seems to be formed before the operculum, as in the zoœcia showing these parts it cannot be detected. In a few older zoœcia, where the peristome is developed into a thick, circular ring, the internal mouth can be seen with a sinus on its *superior* lip, that is, towards the *upper end* of the branches. On the basal side of the mouth is a perforated plate, covering the oœcium. In young zoœcia the oœcium appears first as a cupped elevation, which becomes covered by a perforated plate, and gradually sinks into the substance of the zoœcium. The most curious circumstance is that, although the oœcium appears to be below the mouth, it is really above it, owing to the peculiar reversal of the mouth.

Pœcilopora is allied to *Lekythopora*, but differs in the absence of the long, tubular peristome, and in the mature oœcia being immersed.

EXPLANATION OF FIGURES.

PLATE 156.—Fig. 11, specimen, natural size. Fig. 11*a*, portion from the growing edge, magnified. Fig. 11*b*, portion from the extremity of a branch, magnified, one of the zoœcia showing the internal or primary mouth. Fig. 11*c*, another portion, showing the growth of the oœcium.

I am indebted to Mr. MacGillivray for the specimens and descriptions of the above Polyzoa.

FREDERICK MCCOY.

x 15
Fasciculipora

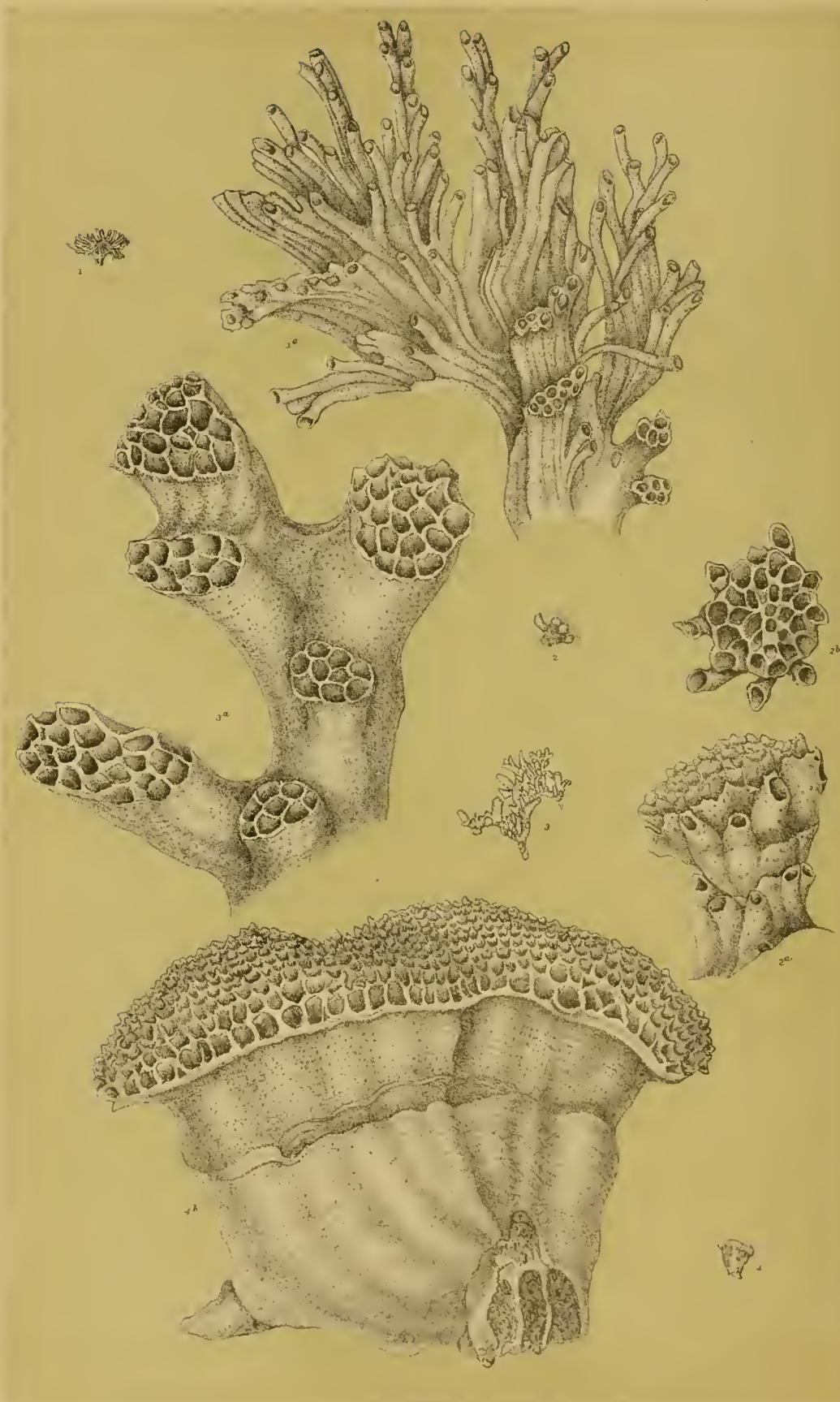

PLATE 157, FIG. 1.

FASCICULIPORA GRACILIS (McG.).

[Genus FASCICULIPORA (D'ORBIGNY). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cyclostomata. Family Frondiporidæ.)

Gen. Char.—Zoarium erect, simple or branched or lobate. Zoœcia opening only at the extremities of the branches or also (in *F. bellis*) in one or more regular series below the extremity.]

DESCRIPTION.—Zoarium small. Zoœcia in somewhat flattened bundles, very long, slender, usually distinct and free at the extremity, surface thickly punctate, except the part immediately below the mouth, which is smooth or transversely wrinkled.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Dec. 1882.

Port Phillip Heads.

A small species, consisting of simple or divided bundles of long, slender zoœcia of a glassy appearance. The extremities usually project and are free, and the mouth is circular. The zoœcia at the surface of the bundles are separated by distinct grooves, and are thickly marked, except immediately below the mouth, with small, raised, white puncta. The oœcia in this, as in the other species of the genus, are unknown.

EXPLANATION OF FIGURES.

PLATE 157.—Fig. 1, specimen, natural size. Fig. 1*a*, the same, magnified.

PLATE 157, FIG. 2.

FASCICULIPORA BELLIS (McG.).

DESCRIPTION.—Zoœcia in small, erect bundles, mostly opening at the summit by prismatic orifices; one or two series opening lower down, the upper of these frequently separated, and their orifices reaching to the same level as those of the chief mass of the bundles; surface minutely punctate.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Dec. 1883.

Port Phillip Heads.

A small and very beautiful species, of which I have only seen one specimen. In this there are six or seven bundles of zoœcia spread over a small calcareous nodule and connected by a calcareous punctate or perforated crust. When viewed vertically, they suggest a resemblance to a composite flower on the end of its pedicle.

EXPLANATION OF FIGURES.

PLATE 157.—Fig. 2, specimen, natural size. Fig. 2*a*, bundle, viewed sideways, magnified. Fig. 2*b*, upper extremity of same, seen vertically.

PLATE 157, FIG. 3.

FASCICULIPORA FRUTICOSA (McG.).

DESCRIPTION.—Zoarium branched, the main branches mostly horizontal, with numerous short branches turned upwards, the scondary branches consisting of bundles of zoœcia, all opening by closely packed prismatic orifices; surface punctate, faintly sulcate longitudinally and (especially in older parts and on the back) transversely corrugated.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Dec. 1883.

Port Phillip Heads.

Distinguished from *F. ramosa* by the much smaller number of zoœcia in the narrower branches. Some of my specimens form dense, shrub-like tufts an inch in diameter.

EXPLANATION OF FIGURES.

PLATE 157.—Fig. 3, specimen, natural size. Fig. 3*a*, portion of the same, magnified.

PLATE 157, FIG. 4.

FASCICULIPORA RAMOSA (D'ORBIGNY).

DESCRIPTION.—Of this I have only seen the portion figured, which is perhaps not sufficient for certain identification. It consists of a short, thick, obscurely bilobed, densely packed bundle of zoœcia, all opening on the summit. The zoœcia are not separated on the surface, which is closely transversely rugose and thickly punctate. The zoœcia open on the surface by prismatic orifices, none of which are produced.

REFERENCE.—Busk, Cat. Pol. Brit. Mus., pt. iii., p. 37, pl. xxxiii., fig. 2.

Portland; Mr. Maplestone.

EXPLANATION OF FIGURES.

PLATE 157.—Fig. 4, specimen, natural size. Fig. 4*a*, the same, magnified.

Mr. MacGillivray has contributed the specimens and descriptions of the *Fasciculiporæ* on this plate.

FREDERICK McCOY.

Tar-ceminacea
Bracebridgia

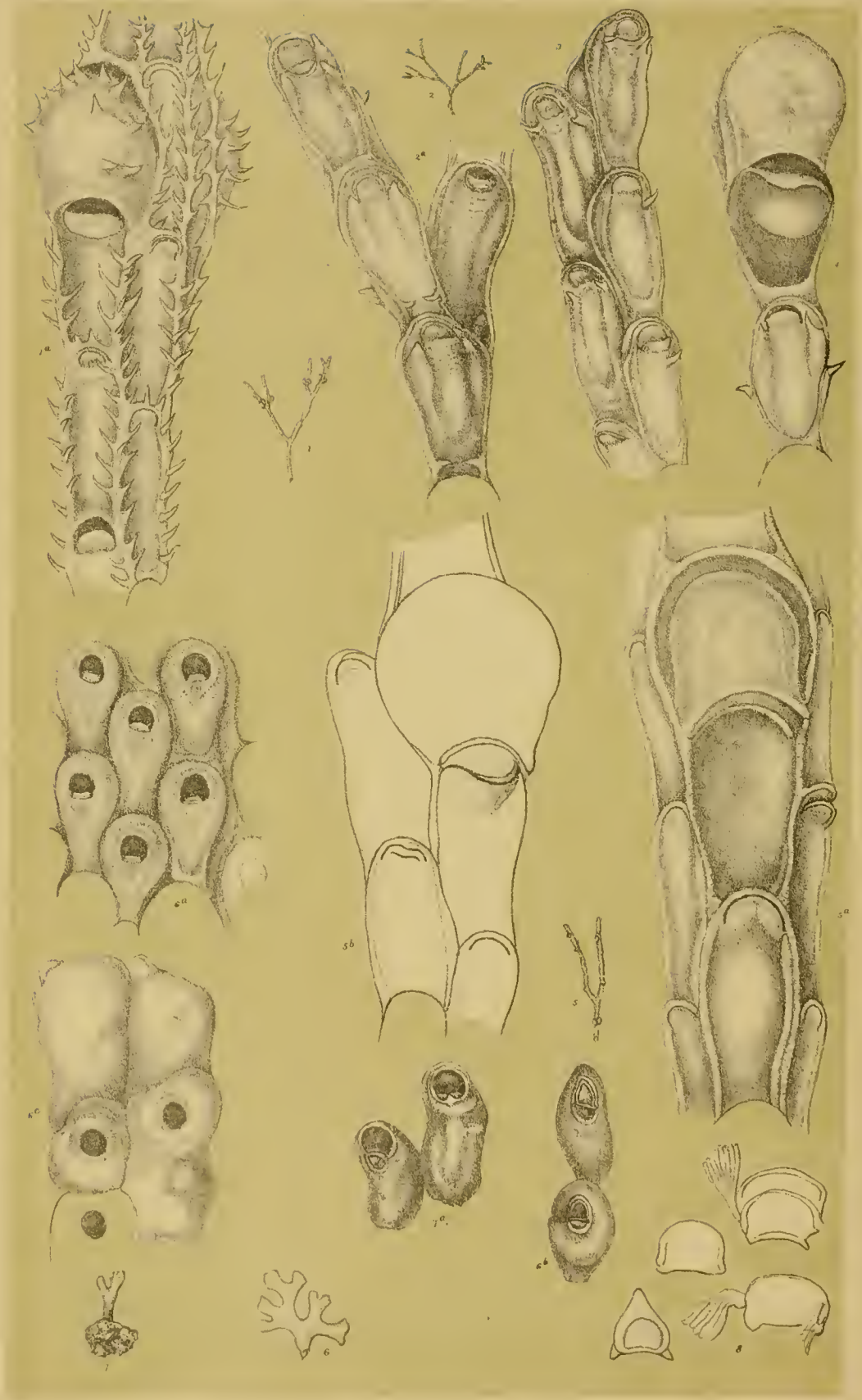

PLATE 158, FIG. 1.

FARCIMINARIA ACULEATA (BUSK).

[Genus FARCIMINARIA (BUSK). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Farciminariidæ.)

Gen. Char.—Zoœcia oblong, elongated, closely contiguous, depressed in front, with raised margins; mouth close to the summit. Avicularia, when present, sessile or sub-immersed at the bottom or on the front of the zoœcia. Oœcia prominent, superior.]

DESCRIPTION.—Zoœcia very much elongated, narrow, separated by distinct, raised margins; a close series of single or furcate aculeate spines, directed upwards and inwards, along the margin. Oœcia large, galeate, with several large, aculeate spines. No avicularia.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., pt. i., p. 33, pl. lxiv., figs. 4, 5; pl. lxv. (bis), fig. 6.

Port Phillip Heads.

Distinguished from the other species by the long, narrow, zoœcia, the marginal aculeate spines, and the aculeate spines on the oœcium.

EXPLANATION OF FIGURES.

PLATE 158.—Fig. 1, specimen, natural size. Fig. 1*a*, portion of same, magnified.

PLATE 158, FIGS. 2–4.

FARCIMINARIA UNCINATA (HINCKS).

DESCRIPTION.—Zoœcia elongated, wide and rounded above, contracting inferiorly, separated by slightly raised margins; frequently a small, incurved, uncinate spine towards the base; an uncinate process from the front of the zoœcium on each side, below or opposite the mouth. Oœcia large, unarmed.

REFERENCE.—Hincks, Ann. and Mag. Nat. Hist., Oct. 1884.

Port Phillip Heads.

In this species the zoœcia are much wider above, contracting below. There is frequently, but not always, an incurved spine on each side towards the lower part. The front of the zoœcium is obscurely divided into three parts: the central, the same width as the mouth, is faintly lined transversely at its upper part; the two lateral, immediately below or opposite the mouth, give origin to a process terminating in a chitinous spine.

I have examined only a few dried specimens, and from these it is impossible to say whether there is any real division of the body-cavity. Mr. Hincks describes and figures the oral uncinate spines as arising from sack-like structures, but the appearance is probably owing to his having examined old, dried and shrivelled specimens. The minute disks on the front of the zoœcia mentioned by him also only occur in old specimens, and are similar to the markings seen under similar circumstances in many other polyzoa.

EXPLANATION OF FIGURES.

PLATE 158.—Fig. 2, specimen natural size. Fig. 2*a*, portion of same, magnified. Fig. 3, portion of branch of another specimen. Fig. 4, two zoœcia, the upper surmounted by an oœcium.

PLATE 158, FIG. 5.

FARCIMINARIA SIMPLEX (McG.).

DESCRIPTION.—Zoœcia much elongated, narrow, but wider above, separated by raised, slightly crenulated, or smooth margins; no spines nor avicularia. Oœcia very large.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov. 1885.

Port Phillip Heads.

This species differs from the others in the absence of avicularia and of spines or processes of any sort on the separating margins of the zoœcia. The oœcium is of great size. It is smooth,

globular, but when dried becomes wrinkled and has a depression round the upper edge and sides, owing to the shrivelling of the delicate outer envelope, which seems to be separated by some distance from the inner part.

In the *Challenger* Polyzoa, Mr. Busk describes eight species of *Farciminaria*, and says that "the genus may be regarded emphatically as abyssal; the mean depth at which the species here enumerated occurred being not less than 1,500 to 1,600 fathoms, or from 450 to 2,750 fathoms." *F. Brasiliensis* was, however, found at from 32 to 400 fathoms. The three species here recorded were dredged from a depth of 10 to 15 fathoms, so that the genus cannot by any means be considered as abyssal, a fact which Mr. Busk would no doubt have ascertained if the dredgings of the *Challenger* had not been almost exclusively confined to deeper waters.

EXPLANATION OF FIGURES.

PLATE 158.—Fig. 5, branch of specimen, natural size. Fig. 5*a*, portion of same, magnified, showing a shrunken oœcium. Fig. 5*a*, another portion, in outline.

PLATE 158, FIGS. 6–8.

BRACEBRIDGIA PYRIFORMIS (BUSK, SP.).

[Genus BRACEBRIDGIA (McG.). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Escharidæ.)

Gen. Char.—Zoarium encrusting, or erect and bilaminate. Zoœcia distinct, entire; mouth sub-circular, with an internal denticle; peristome raised, thick, vicarious avicularia on the free margins of the branches, the triangular mandibles with a projecting articular process at each lower angle.]

DESCRIPTION.—Zoarium usually consisting of flat bilaminate branches with lateral lobes, the branches more or less twisted on themselves. Zoœcia pyriform, separated by deep grooves; mouth sub-circular, with a broad denticle internally, and occasionally a small apiculate process on the lower lip; an elevated ridge round the mouth, the two sides meeting below the lower lip and continuing down the zoœcium as a central elevation; surface smooth or minutely granular. On the free edge of the lobate branches is a single row of aviculiferous cells.

REFERENCE.—*Mucronella pyriformis*, Busk, *Challenger* Polyzoa, pt. i., p. 155, pl. xx., fig. 5; *Bracebridgia pyriformis*, MacGillivray, Tr. Roy. Soc. Vict., Nov. 1885.

This seemingly common species, which I have dedicated generically to my friend Mr. J. Bracebridge Wilson, was first described by Mr. Busk and doubtfully referred to *Mucronella*. It attains a height of one or two inches. In the younger parts of the zoarium the zoœcia are very distinct, but, as age advances, the divisions between them become much fainter, the zoœcia themselves are squarer, and the mouth appears as a circular opening surrounded by a tumid border. Many of the zoœcia are then also closed. On the free edges of the lobate branches, in most specimens, there is a single row of avicularian cells, the triangular mandibles of the avicularia having projecting articular processes at the lower angles One very young specimen (Fig. 7) rises as a small bifid lobe from an encrusting basė. Towards the edge of the encrusting part many of the zoœcia are closed or not properly formed, while, both external and internal to these, are some in which the mouths have clear, narrowly elevated margins, with an apiculate mucro below and, in a few, a broadly elliptical avicularium across the front of the lower lip.

EXPLANATION OF FIGURES.

PLATE 158.—Fig. 6, specimen, natural size. Fig. 6*a*, portion towards the periphery, showing normal zoœcia. Fig. 6*b*, two avicularian cells from the margin of a lobe. Fig. 6*c*, older zoœcia towards the base of the specimen, two completely closed. Fig. 7, young specimen, growing from an encrusting base, natural size. Fig. 7*a*, two zoœcia from encrusting part, showing apiculate process and oral avicularium. Fig. 8, opercula and mandible of avicularium from edge of a lobe.

Mr. MacGillivray has kindly contributed the specimens and descriptions of the above species of the genera *Farciminaria* and *Bracebridgia*.

FREDERICK MCCOY.

ZOOLOGY OF VICTORIA

(Crustacea)

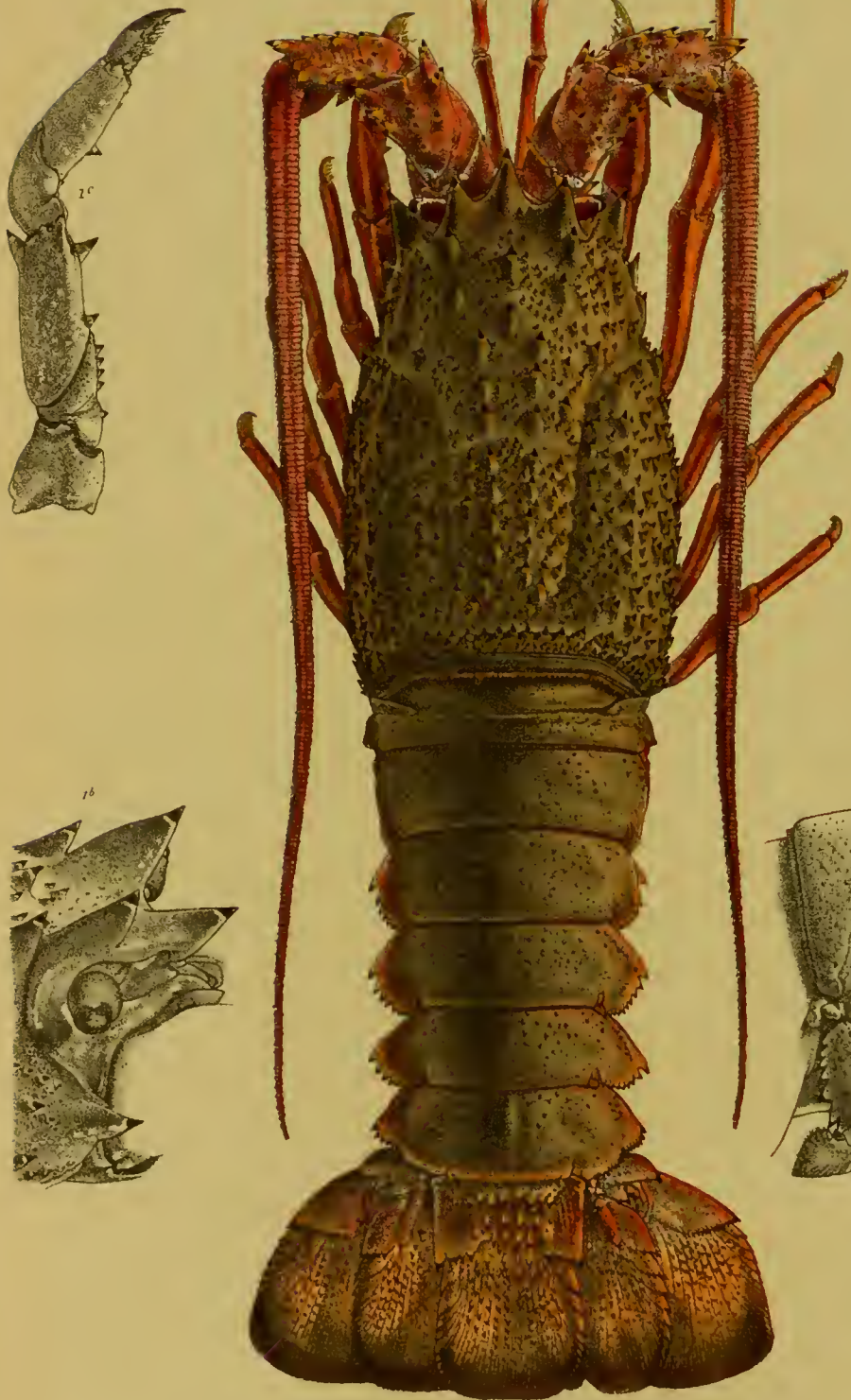

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PLATE 159.

PALINURUS HÜGELI (HELLER).

SYDNEY CRAW-FISH, OR SPINY LOBSTER.

Genus PALINURUS (FAB.). (First section, with rostrum.) (Sub-kingdom Articulata. Class Crustacea. Order Decapoda. Section Macrura. Tribe Astacidea. Family Palinuridæ.)

Gen. Char.—Carapace sub-cylindrical, broadly rounded on sides, with a small rostrum. Antennary segment very narrow above. Antennæ without basal scales, nearly in contact at base, covering the inner antennæ; basal joints long, sub-cylindrical; flagella of inner antennæ very short; anterior legs monodactyle; sternum trigonal.

DESCRIPTION.—Carapace semi-fusiform, narrowed in front, convex above; upper surface and upper half of sides covered with large sub-cylindrical tubercles, directed forwards and upwards, and each terminated with a small sharp spine; a wide, smooth, transverse sulcus a little in advance of the hind margin, behind which the one or two rows of spines are smaller; rostrum strong, conical, sharp-pointed, slightly compressed, smooth, extending forwards more than half its length in advance of front; upper edge straight, horizontal, or very slightly inclined upwards; a small compressed spine in front of orbit on each side of base of rostrum; supra-ocular spines large, shorter than rostrum, smooth, compressed, sharp-pointed, diverging forwards, upwards and outwards; infra-ocular spine on lower front edge of carapace from hepatic region, rather smaller than the rostrum; the spinose tubercles cease at a line extending from the anterior lateral angle of the carapace to the posterior lateral angle, and below this level the sides of the carapace are smooth or with microscopic granules. Anterior legs slender, penultimate joint with one small spine, at one-third its length from base on inner side; third joint compressed to inner ridge, which has one strong spine near anterior edge, and one smaller a little in front of posterior edge; upper or dorsal ridge of all the legs ending in a short spine in front, and with a smaller one at outer front edge; legs otherwise nearly smooth. Abdominal segments nearly uniformly arched and convex, nearly smooth, with very fine, irregular granules and puncta, the posterior edge of sixth segment fringed with small spinous tubercles directed backwards, lateral spinose ends of all but first segment with seven or eight serratures gradually diminishing in size on hinder edge; telson oblong, rounded at end, with longitudinal rows of spinosé tubercles, lateral lobes of tail with rows of very much smaller spines on outer basal half. *Color:* Upper surface of carapace and abdomen dark olive-brown; smooth sides of thorax and lateral spines of abdomen rich reddish-chestnut, with few small, scattered, cream-colored spots; a very conspicuous, cream-colored, narrow line extends from the anterior to the posterior lateral angle of carapace, a little below the level at which the spinous tuberculation of back ceases, and a similar one, at right angles to its anterior third, joins similarly colored lower edge; spines, terminating tubercles of back, and antennæ, black, with cream-color bases; antennæ and legs reddish-chestnut-brown, legs sparingly flecked with cream-color; five lobes of tail rich dull-brownish-orange in middle, with blackish borders. *Measurements:* Total length from tip of

snout to end of tail-flap, 1 ft. Proportional measurements to total length as 100: Length of thorax from tip of rostrum, $\frac{40}{100}$; length of abdomen to penultimate joint of abdomen, $\frac{40}{100}$; greatest width of thorax behind middle, $\frac{25}{100}$; width of anterior third, $\frac{21}{100}$; depth of thorax, $\frac{21}{100}$; greatest width of abdomen, $\frac{22}{100}$; length of telson, $\frac{19}{100}$; greatest width of telson at anterior end, $\frac{13}{100}$; greatest width of telson near posterior end, $\frac{10}{100}$; length of first three joints of outer antennæ, $\frac{20}{100}$; width of ditto, $\frac{8}{100}$; length of flagella of outer antennæ, $\frac{80}{100}$; length of rostrum, $\frac{5}{100}$; length of supra-orbital spines, $\frac{4}{100}$; length of first joint of inner antennæ, $\frac{11}{100}$; second joint, $\frac{5}{100}$; third joint, $\frac{7}{100}$; flagella, $\frac{4\frac{1}{2}}{100}$; length of first pair of legs, $\frac{30}{100}$; second pair, $\frac{39}{100}$; third pair, $\frac{44}{100}$; fourth pair, $\frac{43}{100}$; fifth pair, $\frac{35}{100}$; greatest width of first leg (behind middle of penultimate joint), $\frac{4}{100}$.

Reference.—Heller, Sitzungsbericht der Wiener Akad. der Wissenschaften, v. 45, p. 393, and Reise der Novara Crust., p. 96, t. viii.; ? = *P. tumidus* (Kirk), Tr. N.Z. S., v. xii., p. 314.

This species, which is the Common Sydney Craw-fish, is easily distinguished from the southern one, the *P. Lalandi*,* which is the Common Melbourne Craw-fish, by its nearly smooth abdomen, larger rostrum, smaller anterior legs, and different colors. It has not been figured of the colors of life before. It is so rare south of N. S. Wales that I have only seen one (now in the Museum and figured on our plate), and heard of another, caught on the Victorian coast, near Port Phillip Heads; and I have a single specimen from Tasmania, where, as in Victoria, the *P. Lalandi* abounds, while this is extremely rare. I have little doubt the gigantic specimen described by Mr. Kirk, from the west coast of the North Island of New Zealand, under the name *P. tumidus*, is only a very old and full-grown example of the same species, the size being double that

* Note.—Since the publication of the figures and description of *P. Lalandi* in our Decade XV., I have received several specimens from the Cape of Good Hope through the kindness of Mr. Trimen, of the South African Museum, Cape Town, fully bearing out the remarks I have made as to the identity of our Melbourne Craw-fish and the S. African one. Some of the specimens are very old and large, equalling our largest examples, and in these there is great irregularity in the tumidity of the branchial regions and consequent width of middle of carapace; the most extreme case of this was owing to a diseased condition due to the growth of multitudes of Mussel shells (*Mytilus*) on the gills. The healthy ones had the same proportion as I have figured for our common Melbourne species, which also varies in this respect. I should have drawn attention to the fact that, although in most specimens the color of the abdomen is almost uniform, yet in many examples there are whitish, irregular, dendritic, oblique markings on the lateral portions of each segment, and five, diverging, longitudinal ones on tail-flaps. These are rather more distinct on the Cape specimens; but perfectly identical markings are to be found on many of the Melbourne ones, as well as occasional whitish rings on the antennæ, irregularly varying in position and width.

Since the foregoing portion of this note was in type, I have received a copy from my friend, Professor Parker, of his paper from the Transactions of the N.Z. Institute, Vol. XIX., on the identity of the specimens referred to *P. Lalandi* from New Zealand by Hutton, and by Miers, with those referred by the same authors to Hutton's second species (*P. Edwardsi*) from the same locality, and it is satisfactory to find that we have independently made nearly similar observations. Professor Parker, having also got specimens from the Cape of Good Hope of the true *P. Lalandi*, thinks he finds a character to distinguish them from our Southern Australasian species, to which he provisionally continues the name *P. Edwardsi*. This is a couple of rows of tubercles on the anterior portion of the first abdominal segment, in front of the transverse furrow. I have never seen this extraordinary character in our Victorian specimens; but, on the other hand, *one of our Cape specimens is almost without them*, and Professor Parker notes one or two tubercles in this position in one of his New Zealand specimens. So, clearly, this character cannot separate the species. The second difference relied on by Professor Parker is the third abdominal segment having only one row of tubercles behind the transverse groove, in the New Zealand specimens, but two or three rows in his Cape ones. One of my Cape specimens *has only one row*, as in our ordinary Hobson's Bay examples, and I find our species occasionally exhibiting as many rows of tubercles in front of the groove as the Cape ones.

of our examples, accounting for the greater development of the spines on the inner edge of the second, third, and fifth joints of the first pair of legs in his figure.

EXPLANATION OF FIGURES.

PLATE 159.—Fig. 1, dorsal view of immature specimen, half the natural size. Fig. 1*a*, half of third abdominal segment, natural size. Fig. 1*b*, straight rostrum, natural size. Fig. 1*c*, front leg, half natural size.

FREDERICK MCCOY.

ZOOLOGY OF VICTORIA

(Crustacea)

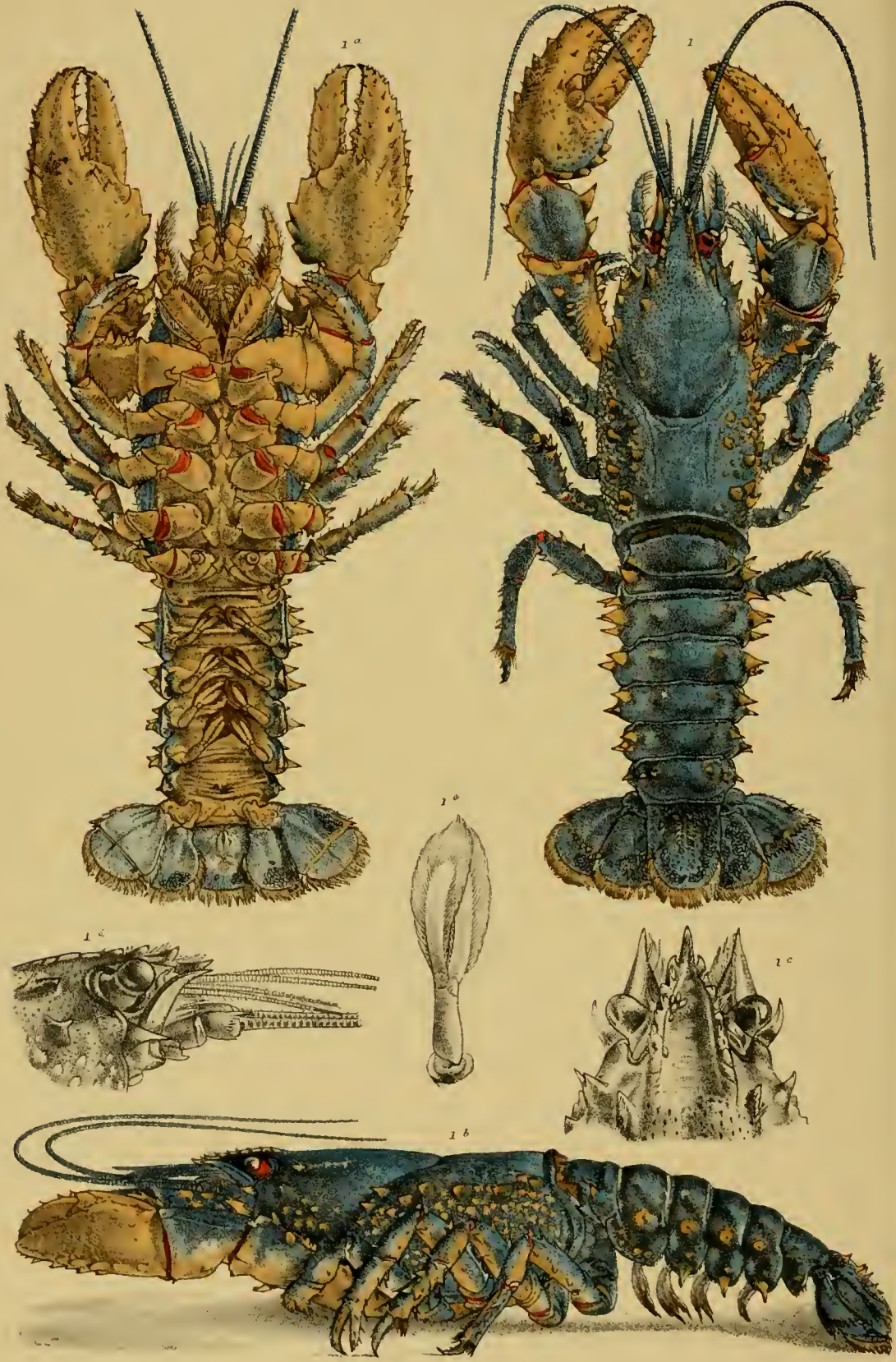

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PLATE 160.

ASTACOPSIS SERRATUS (SHAW SP.), VAR. YARRAENSIS (McCOY).

THE YARRA SPINY CRAY-FISH.

[Genus ASTACOPSIS (HUX.). (Sub-kingdom Articulata. Class Crustacea. Order Decapoda. Section Macrura. Tribe Astacidea. Family Astacidæ. Sub-family Parastacinæ.)

Gen. Char.—Epistome long, flat. Antennæ with base fixed by edge of carapace; scale small; thoracic sterna narrow from the approximation of the large basal joints of the legs; twenty-one gills and one rudiment. Podobranchiæ six, destitute of upper posterior lamellæ and without dilatation of stem, and on first jaw-foot an epipodite with rudimentary branchial filaments; no podobranchiæ on last pair of thoracic legs; six anterior arthrobranchiæ on arthrodial membrane of second jaw-foot to penultimate leg; five posterior arthrobranchiæ on arthrodial membrane from third jaw-foot to penultimate pair of legs; four pleurobranchiæ on epimera of four last thoracic joints. Australia.]

Six months after I published in the Second Decade the illustration of the Murray Cray-fish (*A. serratus*), and about a month after I published in the Third Decade the account of the Yabber Cray-fish (*A. bicarinatus*), there was published the number of the Proceedings of the Zoological Society of London containing Professor Huxley's remarkable paper on the classification and distribution of the Cray-fish, and I gladly recognise the internal anatomical peculiarity of the Australian Cray-fishes which he has pointed out, characterising his family *Parastacidæ*, peculiar to the Southern Hemisphere, and differing from those of the other half of the world in the podobranchiæ having no lamina, and in the first joint of the abdomen being destitute of appendages in both sexes. In these the anterior edge of the carapace overlaps and fixes the basal joint of the antennæ, and the posterior thoracic sterna are very narrow; the coxopodites of the posterior thoracic legs are large and approximate in the midline, and the rostrum and antennary scale short, and the telson, or last joint of the abdomen, is never divided by a transverse joint; the podobranchiæ of the first jaw-foot or maxillipede is like an epipodite, but has some branchial filaments not present in the *Potamobiidæ*. The branchial filaments of the podobranchia and the coxopoditic setæ have hooked tips generally, not found in the northern family.

The two Cray-fish, *A. serratus* and *A. bicarinatus*, which I have figured in this work, differ from the Madagascar genus, *Astacoides*, to which I, with all the best continental writers, had referred them, in the larger number of the gills (*Astacopsis* having twenty-one and a rudiment, *Astacoides* only twelve fully developed). Placing *A. serratus* in the genus *Astacopsis*, which Professor Huxley has proposed, and which is entirely peculiar to Australia, the *A. bicarinatus* may be referred to a section of *Astacopsis* forming the sub-genus *Chæraps* of Erickson (if he be assumed to be wrong in saying the fifth legs have no gills), as, in our specimens, the gills in number, structure, and position are, as Huxley pointed out, like *Astacopsis*, but the podobranchiæ differing in having the inner anterior edge of the stem widened into an ala, covered with branchial filaments.

The old family, *Astacidæ*, is divided from Professor Huxley's observation into two groups, one inhabiting the Northern Hemisphere, for which the name *Potamobiidæ* has been suggested, including the genera *Astacus* and *Cambarus*, in which the gills from the first joint, or coxæ, of the five thoracic legs on each side have the upper part of the stem dilated posteriorly into a broad double, plaited lamina, and that of the adjacent jaw-foot is reduced to an epipodite without branchial filaments, none of the branchial filaments or setæ ending in hooks; the first abdominal segment always with appendages in the male, or in both sexes; those of the four following joints small; the telson, or middle piece of the tail-fin, divided transversely by a more or less perfect joint.

The second group, named *Parastacidæ*, confined to the Southern Hemisphere, containing the genera *Astacoides*, *Astacopsis*, *Chæraps*, *Engæus*, and *Parastacus*, is distinguished by the absence of the upper posterior laminæ to the podobranchiæ: having branchial filaments on the epipodite of the hind jaw-foot. The filaments of the podobranchiæ mostly end in hooked spines, as well as the setæ at their base and stems; the telson is not divided by a transverse suture; the first abdominal segment has no appendages in either sex, and those of the four following segments are large.

Our plate 160 illustrates a remarkable variety of the typical *A. serratus* of the Murray, common in the Yarra and its numerous affluents flowing southwards into the sea of the south coast of the colony; and as very few of the inhabitants of these river systems are identical (most of the species and many of the genera being dissimilar), this form is worthy of special note. It is usually less than half the size of the Murray individuals, being usually only five inches and rarely six inches long; it further differs in the whole thorax and abdomen above being of an intense Prussian-blue color, the spines, chelæ, and under surface ivory-white, with the membrane of the joints red. All the proportions and the number and disposition of the spines seem to me to agree so closely with the large pale Murray form, that, although so unlike at first glance, I have no doubt the southern race is merely a variety, which, for convenience of reference, may be distinguished by the name of the river in which it is chiefly found, from its mouth at Melbourne to its highest branches. The colors of those from the Watts River are particularly intense.

EXPLANATION OF FIGURES.

PLATE 160.—Fig. 1, male specimen, viewed from above, natural size. Fig 1*a*, same, viewed from below, showing the male openings in the base of the hind pair of legs, and the absence of appendages to the first abdominal segment. Fig. 1*b*, side view of same. Fig. 1*c*, top of head, magnified two diameters, to show details of rostrum. Fig. 1*d*, side view of portion of head, magnified two diameters, to show proportional dimensions of rostrum, antennary scale, and basal joints of antennæ. Fig. 1*e*, one of the abdominal appendages, magnified three diameters.

NOTE.—The color of the under surface, and chelæ and spines of upper surface, are rather too dark, and should be of an ivory-white with a slighter brown tinge.

FREDERICK McCOY.

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ROGIC

Natural History of Victoria.

PRODROMUS

OF THE

ZOOLOGY OF VICTORIA;

OR

FIGURES AND DESCRIPTIONS OF THE LIVING SPECIES OF ALL CLASSES

OF THE

VICTORIAN INDIGENOUS ANIMALS.

DECADE XVII.

BY

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ADVERTISEMENT.

It having been considered desirable to ascertain accurately the natural productions of the Colony of Victoria, and to publish works descriptive of them, on the plan of those issued by the Governments of the different States of America, investigations were undertaken, by order of the Victorian Government, to determine the Geology, Botany, and Zoology of the Colony, to form collections illustrative of each for the public use, and to make the necessary preparations for such systematic publications on the subject as might be useful and interesting to the general public, and contribute to the advancement of science.

As the geological and botanical investigations have already approached completion, and their publication is far advanced, it has been decided now to commence the publication of the third branch completing the subject, namely, that of the Zoology or indigenous members of the different classes of the animal kingdom.

The Fauna not being so well known as the Flora, it was a necessary preliminary to the publication to have a large number of drawings made, as opportunity arose, from the living or fresh examples of many species of reptiles, fish, and the lower animals, which lose their natural appearance shortly after death, and the true characters of many of which were consequently as yet unknown, as they had only been described from preserved specimens. A Prodromus, or preliminary issue, in the form of Decades, or numbers of ten plates, each with its complete descriptive letterpress, will be published, of such illustrations as are ready, without systematic order or waiting for the completion of any one branch. The many good observers in the country will thus have the means of accurately identifying various natural objects, their observations on which, if recorded and sent to the National Museum, where the originals of all the figures and descriptions are preserved, will be duly acknowledged, and will materially help in the preparation of the final systematic volume to be published for each class when it approaches completion.

Natural History of Victoria.

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PREFACE.

In the first and second plates of this Seventeenth Decade, detailed figures, of the colours of life, are given for the first time of species of three more genera, *Lialis*, *Aprasia*, and *Pseudodelma*, of the snake-like group of Lizards so singularly abundant in Australia.

The third plate gives figures of the colours of life, also for the first time, of one of the magnificently coloured "Parrot Fishes" of our coasts, the *Labrichthys laticlavius*.

The fourth plate figures for the first time of the living colours a most beautiful new species of that splendidly coloured group of fishes popularly called "Wrasses" in England, the *Hetcroscarus Macleayi* (McCoy).

The four following plates illustrate the details of further species of the genus *Cellepora*, so important to the geologist investigating our Tertiary rocks, as well as to the zoologist, from the specimens and descriptions presented by Mr. Macgillivray.

Plates 169 and 170 give detailed figures of a new species of Squid, or Cuttlefish (*O. Gouldi*, McCoy), of the interesting genus *Ommastrephes*, having a cone at the end of its internal dorsal pen.

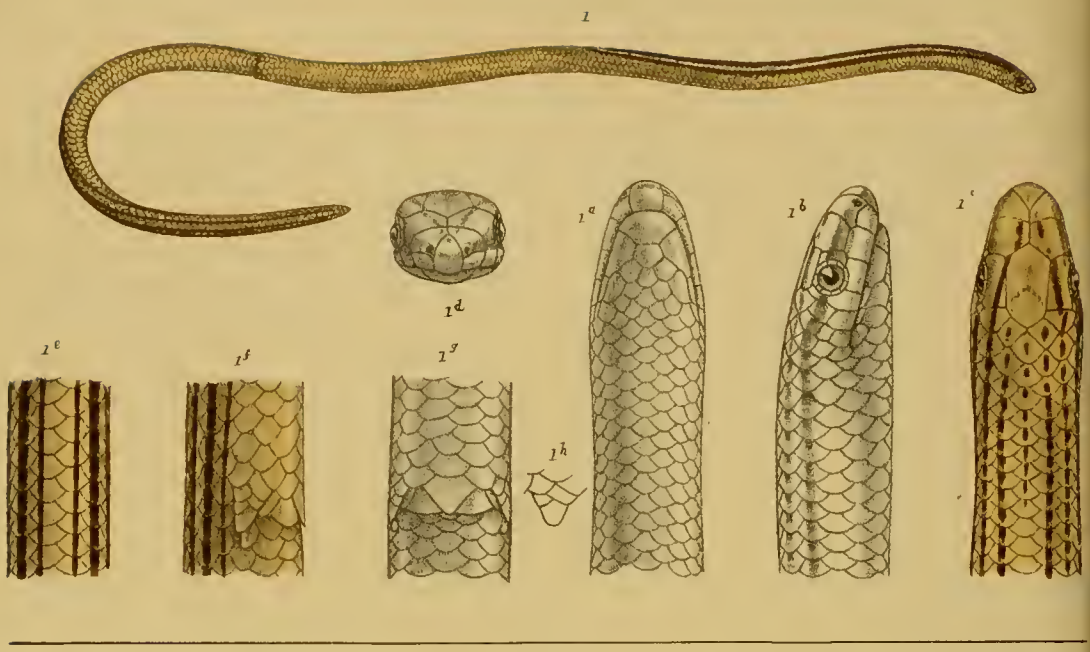
The succeeding Decades will illustrate as many different genera as possible, and will deal first, usually, with species of some special interest and of which good figures do not exist, or are not easily accessible.

FREDERICK McCOY.

10th October, 1888.

ZOOLOGY OF VICTORIA

(Reptiles)



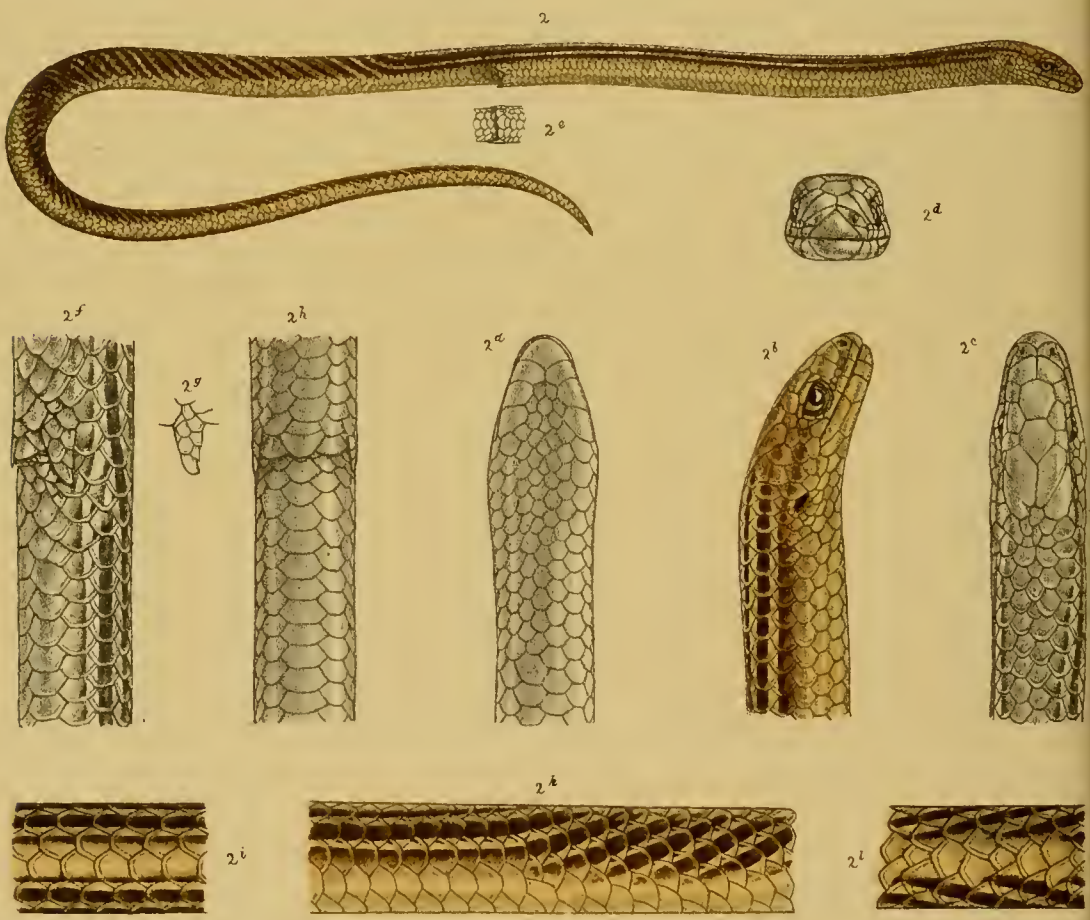


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PLATE 161.

LIALIS BURTONI (GRAY).

BURTON'S LIALIS.

[Genus LIALIS (GRAY). (Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Sub-order Leptoglossæ. Tribe Geissosaura. Family Pygopidæ.)

Gen. Char.—Body snake-like, very long, cylindrical, tapering. Head pointed, parietal bones united into a single one; teeth sharp, directed backwards, swollen at base; top of head covered with small, scale-like plates; external ear-opening obliquely oval; tongue elongate, tapering, bifid; scale-like rudiments of hind limbs very small. Scales soft, smooth, imbricating; two median abdominal rows and one median sub-caudal row larger than the others. Preanal pores few. Australia and Islands to N.E.]

DESCRIPTION.—Body and tail sub-cylindrical, very gradually tapering; tail, when perfect, exceeding the head and body in length. Head long, tapering, with straight sides, to a narrow, obtusely rounded tip; from tip of snout to anterior margin of eye equal to distance from anterior margin of eye to ear in some specimens, but only equals from posterior margin of eye to ear in others; a narrow, projecting angular ridge from nostril over eye to a little beyond ear, separating the flattened top of the head from the slightly concave cheeks; two rows of scales on prominent margin of lower lip continued some variable distance along sides of body, forming a perceptible ridge; approximate half of scales of each row usually coloured white with a dark outline, giving the erroneous appearance of two rows of scales smaller than the adjacent ones. Numerous small plates of top of head variable in size, shape and number; rostral plate bent under, so that the mouth opens behind front edge of snout, about four times wider than high; about 17 small upper labials. Nostril large, in posterior edge of a swollen nasal plate, with one or two post-nasal plates; loreal plates of cheek, between nostril and eye, very small, numerous, scale-like; eye small, separated from labials by two or three rows of loreal scales, with a narrow, circular, immovable eyelid, with one or two rows of minute scales; chin plate very large, sub-pentagonal; a row of seven or eight large, paddle-shaped plates, each with an abruptly narrowed posterior extension, separated from the lower labials by a row of very small, longitudinally oblong scales. Nineteen or twenty-one rows of scales round middle of body. Hind limbs extremely small, apparently covered by two or three scales, scarcely differing from the lateral ones of the body, which they follow. Preanal pores two on each side, large, notching posterior edge of the scales; about eighty pairs of enlarged median abdominal plates. *Colour:* Some specimens (as our figure 1) pale greyish-brown, lighter above, darker below, darkest on the cheeks, with a narrow white band from lower lip a variable distance along sides of body, usually edged with a very fine dark line; a similar white streak from nostril, running along angle over eye and ear a short distance along neck, and with a small, dark dot in centre of each scale of back (var. *L. punctulata*); others of richer brown, darker below, with about eight rows of large white spots on under side, and five or seven narrow, dark streaks along back, the middle one opening out into two on head, uniting again on snout (var. *L. Burtoni*); other specimens have dark, vertical markings on cheeks, and larger and darker triangular patches on

sides of lower jaws; some (as our figure 2) have the back plain, dotted, without streaks, as in the type *L. punctulata*, but with the large, white spots below, as in the typical *L. Burtoni*. *Measurements:* Tip of snout to base of leg-flaps, 6 in.; tail, 6 in. 6 lines; tip of snout to anterior edge of eye, 4 lines; tip of snout to ear, 8½ lines; diameter of middle of body, 3½ lines.

REFERENCES.—*Lialis Burtoni*, Gray, Cat. B. M. Lizards, p. 69; Ereb. and Ter., p. 5, t. 8, f. 2; Grey's Trav. Austr., v. 2, p. 437, t. 3, f. 1 + *L. bicatenata*, Gray l.c. + *L. punctulata*, Gray l.c. + *L. leptorhyncha*, Peters, Monatsberichte der Königlichen Preuss. Akad. der Wissenschaften zu Berlin, 1873, p. 605.

The genus *Lialis* I think, with Mr. Boulanger, contains only one species at present known, varying greatly in colour and slightly in the proportional length of the snout, which characters have been relied on by Gray and Peters in naming the supposed different species indicated in the synonyms. These lizards are even more like snakes than the *Pygopus*, from the almost imperceptible smallness of the rudiments of the hind limbs, scarcely larger or longer than an ordinary adjacent scale, and the immovable eyelids. The external open ear, however, and fleshy tongue indicate at a glance the true affinity to be with the lizards and not the snakes. The curious character of the single (coalesced pair) parietal bone in the skull, and also the sharp recurved teeth with swollen base, so different from others of the *Pygopidæ*, almost warrant the adoption of Gray's family *Lialisidæ* for the genus, which approaches the *Varanidæ* in this and in the premaxillary being single and produced backwards between the nasals. Our figure 1 gives the typical colouring of the variety named *L. punctulata* by Gray, in which a very distinct white labial band extends along the lower lip, and runs a variable length along each side of the body, separating a darker greyish brown under side from a much lighter, greyish brown upper side, and with a shorter narrow white band from nostril over eye beyond the ear; the cheek between these lines darker than any other part of the surface; most of the scales of the back with a small dark dot near middle. Our figure 2 shows the colouring half-way between that species and *L. Burtoni*, from Trinity Bay, having longitudinal dark streaks on top of head, and the large conspicuous white spots on dark greyish-brown under side, and vertical dark patches on side of cheeks and lower jaw, as in *L. Burtoni*, but with the lighter, plain, unstreaked upper

side, with a small dot in centre of each scale, as in *L. punctulata*. Other specimens in the Museum Collection have the five longitudinal brown streaks and rows of dark and light spots on whole of upper surface, as in the typical *L. Burtoni*, with rows of conspicuous white spots on darker under surface. All the varieties have the curious and most unusual colouring of the darker surface being below, instead of above, as usual.

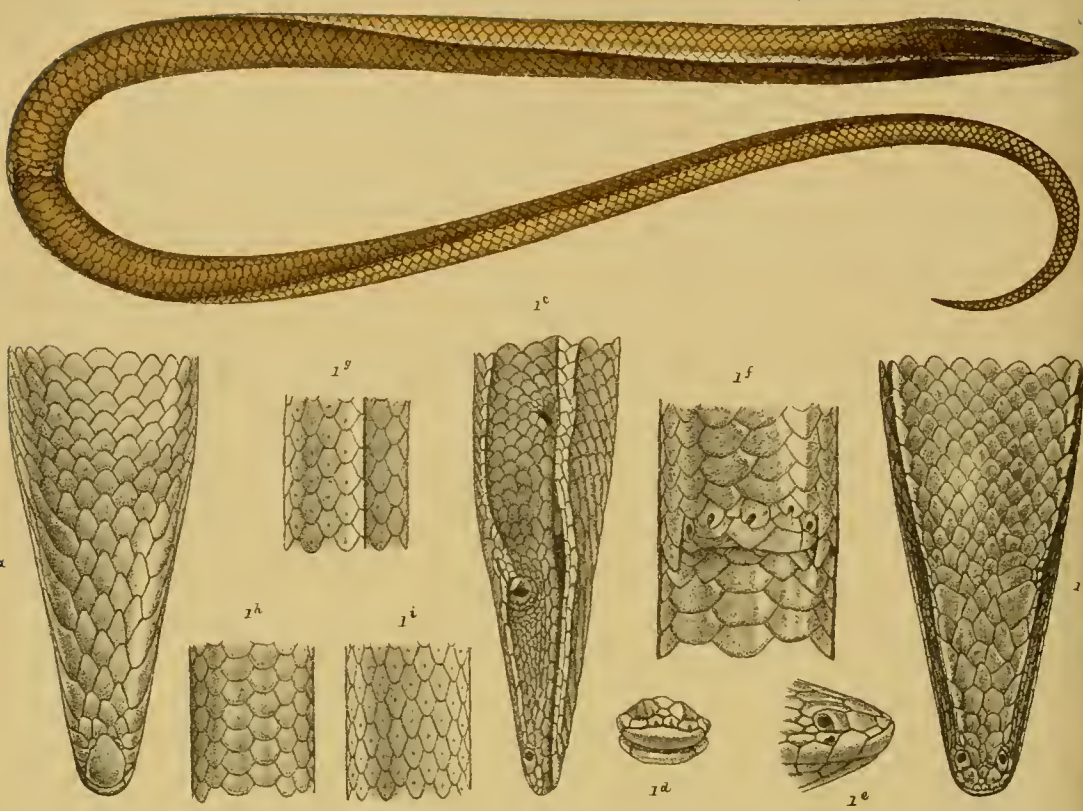
The specimens found in Victoria, measured above, are smaller than those generally of warmer latitudes ; but I have a specimen in the Museum from Duke of York Island, of the size, shape, and colouring of our figure 1.

Not very uncommon in the Mallee Scrub and other warmer parts of Victoria.

EXPLANATION OF FIGURES.

PLATE 161.—Fig. 1, plain coloured specimen of the variety named *L. punctulata*, natural size. Fig. 1*a*, under side of head, magnified three diameters, to show the large chin plate and lateral rows of paddle-shaped plates. Fig. 1*b*, top of head, magnified three diameters, showing plates of head. Fig. 1*c*, side view of head, magnified three diameters, showing large nasal plate, very numerous scale-plates of loreal region, eye with scaly lid, and ear. Fig. 1*d*, front view of tip of snout, magnified five diameters, showing wide rostral, inflected below, and edge of chin plate. Fig. 1*e*, side view of snout, magnified five diameters, showing large nasal with two post-nasal plates. Fig. 1*f*, posterior end of body and anterior end of tail, magnified three diameters, showing two rows of large abdominal and one row of large sub-caudal plates, four preanal pores, and the minute leg-flaps. Fig. 1*g*, side view of middle of body, magnified two diameters, showing upper dotted and lower plain scales. Fig. 1*h*, lower surface of body, magnified two diameters, showing proportion of two median rows of larger plates. Fig. 1*i*, scales of back, magnified two diameters. Fig. 2, variety, with conspicuous white spots, as in the type *L. Burtoni*, but without back streaks, natural size. Fig. 2*a*, lower side of head and part of body, to show disposition of large white and some dark spots, magnified three diameters. Fig. 2*b*, top of bead, magnified three diameters, showing dark marks, longitudinal streaks (not found farther back on this specimen). Fig. 2*c*, side view of head, magnified three diameters, showing vertical dark marks and traces of longitudinal dark streaks. Fig. 2*d*, tip of snout, front view, magnified five diameters. Fig. 2*e*, side view of snout, magnified five diameters, showing nasal plates, with only one post-nasal. Fig. 2*f*, view of preanal pores and small leg flaps, magnified three diameters. Fig. 2*g*, scales of back unstreaked and dotted, as in *L. punctulata*, magnified three diameters. Fig. 2*h*, side view, magnified three diameters, showing relation of upper and under scales, with leg-flaps and preanal pores.

FREDERICK MCCOY.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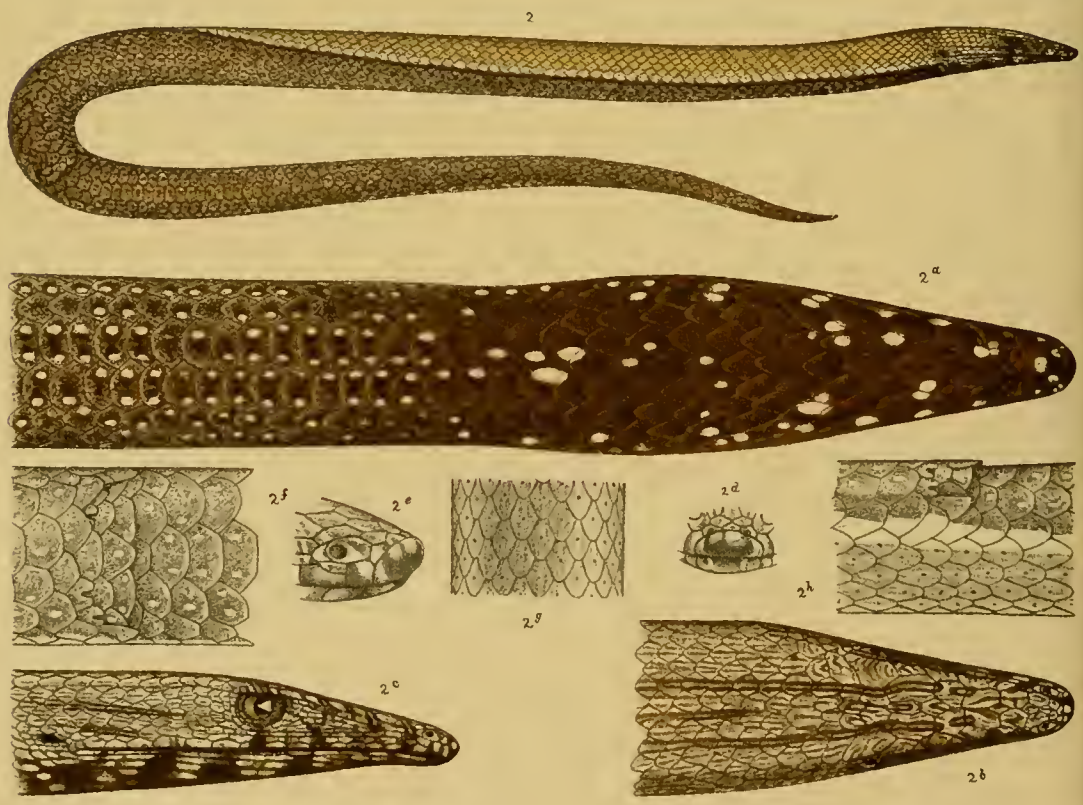
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PLATE 162, FIG. 1.

APRASIA PULCHELLA (GRAY).

THE LINED APRASIA.

[Genus APRASIA (GRAY). (Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Sub-order Leptoglossæ. Tribe Geissosaura. Family Pygopidæ.)

Gen. Char.—Body and tail long and slender, cylindrical, tapering, vermiform; destitute of anterior limbs, posterior ones forming a very minute flap on each side of base of tail; covered with smooth, hexagonal scales, those below only slightly wider than those above. Head small, semi-elliptically rounded in front, cheeks vertical, muzzle projecting beyond lower jaw in front; one pair of large, quadrate nasal plates; one pair of freno-nasal large shields, covering the cheeks; one large, hexagonal vertex plate or pre-frontal; a pair of small superciliary plates on each side; rostral plate large; labial plates large, few; nostrils very small, near suture, between the tip of the front upper labial and the square nasal plate; vertex plate large, hexagonal; no parietal shields; eyes with a circular eyelid of a marginal series of small scales; pupil round; external ears none, the aperture being covered by the scales. Tongue rounded and slightly notched at tip. Parietal bones separate. Teeth small, blunt, with cylindrical base, pleurodont. Preanal pores none. Australia.]

DESCRIPTION.—Head scarcely wider than neck, semi-elliptical, pointed in front; rostral plate long, narrow, lower two-thirds nearly parallel-sided; the pointed upper-third end bent over to appear on upper surface of head, between the nasal plates, separating them nearly to their posterior margin; nasals large, quadrate, joining by a small portion of posterior inner edge above, with the nostrils pierced in the anterior outer angle, close to suture of first upper labial plate, which is small and quadrate; second labial plate about as long as the first, but rising higher to join the outer side of the freno-nasal; third upper labial smaller than second and indented above by the eye; fourth labial rising to nearly middle of eye behind. Prefrontal or freno-nasals hexagonal, larger than the nasals, joining in mid-line above, joining by one of their anterior edges to posterior edge of the nasal, joining vertex by inner posterior side, and joining temporal plate by middle posterior edge, joining small frenal or antocular plate by outer posterior side. Vertical pre-orbital or frenal plate in front of eye, three times higher than long. Vertex or frontal plate very large, hexagonal; no parietal nor occipital plates. Supra-orbital plates large, extending from long side of vertex plate to eye-lid outside, and prefrontal in front, and body scale behind. Mental plate large; first lower labials very large, reaching from mental to vertical from middle of eye, bent under the chin, and separate by a small hexagonal plate behind the mental. Scales of throat small, hexagonal. Twelve rows of hexagonal, smooth scales round the body, two middle belly rows larger and wider than the others. Three large preanal scales, with very minute rudimentary leg-flaps on each side, covered with two rows of three minute scales each, and slightly exceeding one of the back scales in length; circular eye-lid of one row of scales. *Colour:* Dull brownish yellow above, paler below, with six to nine longitudinal, narrow, dark-brown streaks, sometimes forming dots on the outer row on each side, the next inner streak strongest and going through the eye; rarely, a ninth, central, small, dotted streak on back. Length of head, 3 lines; from tip of snout to base of tail, 4 inches; diameter of middle of body, 2 lines.

Reference.—Gray, Grey Jour. Exp. Aust., v. 2, p. 438, t. 4, f. 2 = *A. octolineata*, (Peters) Monatsberichte der Königlichen Preuss. Akad. der Wissenschaften zu Berlin, 1863, p. 233.

This beautiful little creature has the shark-shaped head of the Blind Worms or Worm Snakes, the front of the snout and curved rostral plate projecting in front of the mouth, probably to facilitate burrowing in the ground. In the situation of the hind leg-flaps of *Pygopus* and *Delma* there is a very minute triangular group of about three scales, much smaller than the others, and resting in a depression, no doubt representing the leg-flaps of those genera, and which has been overlooked by the older writers, although noticed by Mr. Boulanger. The absence of the external ear aperture also shows an approach to the Worm Snakes. The eyelids, however, and fixed jaws indicate their true affinities with the Lizards, from which, however, they depart more than any other form known. I have no doubt that Dr. Günther is correct in refering the *A. octolineata* of Professor Peters to this same species, as I find the streaks vary from six to nine, and the normal number of rows of scales for the present species is twelve.

The first Victorian specimen I have seen was presented to the Museum by my former pupil, Dr. E. Hearn, from Lake Wallace, where it had been turned up by the plough in a field. Subsequently I received another from Mr. Goldstein, who found it at Portland in April 1879.

Explanation of Figures.

Plate 162.—Fig. 1, average specimen, natural size, but the tail shorter than its proper proportion, from having been lost and re-grown. Fig. 1*a*, top of head and neck, magnified five diameters, to show plates of top of head; showing also the unusual middle streak for a short distance in this specimen. Fig. 1*b*, side view of head, magnified five diameters, to show the scaly eyelid, pre-ocular or frenal plate, edge of supra-ocular plate, freno-nasal, nasal and labials. Fig. 1*c*, under side, to show large chin plate and post-mental plate, and enlarged first labial. Fig. 1*d*, front view of snout, to show relation of rostral to adjacent plates. Fig. 1*e*, top of middle of body. Fig. 1*f*, side view of base of tail, showing dorsal and ventral scales and minute leg-flaps, magnified five diameters. Fig. 1*g*, same, viewed from below, showing large preanal scales. Fig. 1*h*, leg-flap, more highly magnified.

Frederick McCoy.

PLATE 162, FIG. 2.

PSEUDODELMA IMPAR (FISCHER).

FISCHER'S FALSE DELMA.

[Genus PSEUDODELMA (FISCHER). Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Sub-order Leptoglossæ. Tribe Geissosaura. Family Pygopidæ.)

Gen. Char.—Body and tail very slender, gradually tapering. Head moderate, tapering to bluntly rounded snout. Gape wide. Only one pair of plates, meeting in middle, between nasals and prefrontal plate. Nostrils large, near anterior edge of nasals, which meet above; ear-opening oblique, moderately large. Eye with rudimentary scaly eyelid. Teeth very small, numerous, blunt. Scales of body in longitudinal rows, until a little beyond base of tail, beyond which the lateral rows extend abruptly, obliquely upwards and backwards from middle sub-caudal row. No preanal pores; two or three enlarged preanal scales. Posterior leg-flaps very small, of two rows of scales. Australia.]

DESCRIPTION.—Head narrow, semi-oval, bluntly rounded in front. Teeth very numerous, very minute, blunt. Tongue flat, scaly, deeply notched at tip. Rostral large, pentagonal or nearly triangular, about twice as wide as high, separating the nasal plates, except at their posterior superior angles. Nasal plates large, sub-trigonal or tetragonal, with a large nostril pierced near middle, meeting on the mid-line above, behind the apex of the rostral plate, and prolonged backwards nearly as far as posterior edge of first labial below. Fronto-nasal plates large, quadrangular, meeting by longest side in middle of top of head, acutely pointed in front, obtusely pointed behind, a narrow portion bent down on cheek, touching the first of a series of six small plates over the second, third, and fourth labials, extending from the nasal to the eye. One large, quadrate, antocular plate joining posterior edge of naso-rostral on each side. Pre-frontal or inter-nasal plate large, heptagonal, nearly as broad as long. Frontal plate heptagonal, longer than wide, acutely pointed behind. Parietals large, with a band-like plate on outer posterior side of each, with or without a small occipital plate between their posterior ends. Two rows of minute scales round the orbit, and three vertical rows of slightly larger vertical scales in front of it. Three supra-ocular plates joining two large temporal plates by their upper edges. Upper labials seven, the fourth longer, but less deep, than the others, underlying the eye, from which it is separated by a row of four or five small scales, the anterior one of which supports the posterior two out of the three vertical rows of small scales in front of the orbit. Chin plate moderate, rhombic. Lower labials three, the first meeting below, behind the chin plate; second largest also prolonged under sides of jaw, but not meeting in the middle; third twice the length, but only one-fourth the depth of the other two. Body scales hexagonal, imbricating, very smooth and glossy; two middle ventral rows wider than long; length and width of the others more nearly equal; fourteen or fifteen rows of scales round the middle of body (the middle row, when fifteen appear, being frequently absent for distances of six or seven scales long, and re-appearing; when absent, leaving only fourteen rows round the body). Leg-flaps covered with two rows of three scales each, the whole being double the length of the enlarged preanal scales, or nearly as long as three of the lateral scales. Scales on back of base of tail in longitudinal rows as far as about the twelfth scale, beyond which the lateral rows extend obliquely upwards and backwards, from the three larger inferior shields to the one or two irregular dorsal rows in middle of tail; about fifty-one pairs of large abdominal scales from hinder part of throat to vent, and about one hundred and twenty-six transversely enlarged, hexagonal plates in median row beneath tail.

Colour: Above greyish-olive, fading to greyish-white below; top of head dark-brown; two or three scales wide of middle of back and tail plain; on each side, three narrow white lines, with dark-brown bands of transverse spots between them, forming three or four longitudinal lines of narrow light, and dark broad, stripes on each side, running straight from head, longitudinally, as far as twelve scales beyond the vent, where they turn abruptly, obliquely upwards and backwards in accord with the change of direction at this point of the lateral caudal scales. *Measurements:* Snout to base of tail, 3 in.; tail, 6 in.; diameter of body at middle, 3 lines; length of leg-flap, 1½ lines; snout to ear, 4 lines; snout to eye, 1½ lines.

Reference.—Archiv. für Naturgeschicte 1882, p. 287.

This genus differs from *Delma* in the more simply plated head, arising from only one pair, instead of two pairs, of large plates intervening between the nasals and inter-nasal or pre-frontal; and, further, by the singular, oblique direction of the lateral rows of scales on the sides of the tail. The instability of the median dorsal row of scales, which I have noted, is a curious character, giving in some parts an odd number of rows of body scales, and, in the other adjacent parts, an even number. Fischer's figure in the Archiv. für Naturgeschicte, of the natural size, is very inexact, and, especially, the leg-flaps are represented as far too long. He is also certainly in error in supposing the teeth to be absent, as I find they are very numerous and blunt, but, of course, very minute and not easy to see.

Not very uncommon near Melbourne.

The specimen figured was presented by D. Kershaw, who found it under stones, near junction of Yarra and Merri Creek.

Explanation of Figures.

Plate 162.—Fig. 2, average specimen, natural size. Fig. 2*a*, under side of head and neck, magnified three diameters, showing large labials, small throat scales, and suddenly enlarging two rows of scales of belly. Fig. 2*b*, side view of head and neck, enlarged three times, showing characteristic plates. Fig. 2*c*, top of head and neck, magnified three diameters, showing head plates, and the median dorsal row of scales following occipital scale, then absent, then re-appearing for three scales, and then being absent for hinder portion as far as figured. Fig. 2*d*, front view of snout, magnified three diameters, showing form of rostral and mental plates. Fig. 2*e*, three preanal scales and minute leg-flaps, natural size, from below. Fig. 2*f*, side view of leg-flap and adjacent scales, magnified three diameters. Fig. 2*g*, leg-flap, magnified. Fig. 2*h*, under side of last abdominal, enlarged preanal scales and sub-caudal scales, magnified three diameters. Fig. 2*i*, upper side of middle of back. Fig. 2*k*, side view of anterior part of tail, showing change from longitudinal to oblique rows of scales, magnified three diameters. Fig. 2*l*, upper side of middle of tail, magnified three diameters.

Frederick McCoy.

A. Bartholomew del. et lith.

Prof. Mc Co. dirext

Steam Lithic Gov. Printing Office

PLATE 163.

LABRICHTHYS LATICLAVIUS (RICH, SP.).

THE BROAD-STRIPED, OR SENATOR, PARROT-FISH.

[Genus LABRICHTHYS (BLEEKER). (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygii. Sub-order Pharyngognathi. Family Labridæ.)

Gen. Char.—Body moderately compressed, oblong; snout narrow, projecting; scales large; operculum scaly, cheeks more or less scaly; preoperculum not serrated. Lateral line continuous. Teeth sharp, conical, in one or two rows in upper jaw, usually 1 or 2 large canine teeth on each side in front, and often a large, conical, posterior canine tooth at angle of mouth in upper jaw. Fins, 9 spinous and 11 branched rays in dorsal, and 3 spinous and 10 branched in anal. Pacific and Indian Archipelago.]

D. 9 + 11; V. 1 + 5; P. 12; A. 3 + 10; L. lat. $26\frac{3}{10}$.

DESCRIPTION.—Body moderately slender, depth about $3\frac{3}{4}$ in total length, including caudal. Head with convex profile, small, about one-fourth of total length, including caudal; top of head and cheeks set with coarse, perforated granules, scattered above, but running into nearly vertical, branched ridges below; a sub-vertical row of 6 or 7 large scales, rather nearer the edge of the preoperculum than the eye, extending from about the level of top of eye, curving forward below to about level of corner of mouth; a row of 12 rapidly decreasing, conical teeth in upper jaw, the first (or canines) twice as large as the next; a conical canine, nearly as large as the front one, projecting outwards and forwards from corner of mouth; a second row of smaller and more numerous teeth within the outer row; a similar row of eleven decreasing from the large front canine in lower jaw; two vertical rows of large, rounded scales on anterior part of operculum, with one or two forming an imperfect third row; posterior membranous margin of operculum forming a narrow, rounded, smooth lobe, forming two sides of an isosceles triangle from upper junction; gill-opening large, curved. Scales of body large, rounded, thin-edged, with fine, granular, flexous, radiating striæ, strongest at middle; those of lateral line with from 4 to 8 flexuous, dichotomous, branching tubes, set with porous granules, the five last running to middle of tail from level of last dorsal ray, one scale's width lower than anterior ones; 26 scales along lateral line, 3 above and 10 below; no scales on dorsal fin. *Fins:* Spinous part of dorsal of 9 spines, slightly less elevated than the posterior portion, of 11 branched rays; ventral rhomboidal, acutely pointed, from second branched ray being longest, 1 spinous and 5 branched rays; pectoral obtusely rounded, of 12 rays; anal of 3 short spinous, and 10 longer, branched, rays slightly increasing, so that the last is longest; caudal sub-truncate, obtusely rounded. *Colour:* Body, back and cheeks rich sap-green, with 3 broad, bright, purplish, chestnut madder bands, one from temple behind the eye to the end of the caudal; a second, wider, from angle of operculum joins the upper one about 3 rays from vertical of end of dorsal; and a third, broadest, occupies the lower part of body over anal and lower portion of tail, connected with the middle one by a large blotch of same colour at anterior portion of anal; each of these stripes is edged by a narrow interrupted line of ultramarine-blue. Throat and belly in front of anal purplish-white, with longitudinal, broken, flexuous lines of pale yellow and blue; head with long, flexuous

blue lines radiating from the eye, the intervening spaces varying irregularly, either the green or purple of the body in different specimens; dorsal fin sap-green at base, irregularly clouded with reddish and pale blue; a definite, narrow, continuous edging of bright blue, and numerous, ultramarine-blue, round spots on membrane of hinder part of dorsal in most specimens, in some specimens pale purple with narrow blue edge, without spots, but clouded with blue in front, and dull red behind; anal sap-green at base with a blue basal line, the marginal half dark-purplish with a narrow blue line between it and the green, and a bright blue, narrow edge and numerous round, blue spots on membranes; caudal with green of body extending along upper edge and middle, as narrow bands; rest of membrane of the purplish tint of body stripes, with a broad, darker band at posterior third; rays and round spots on membrane bright blue (in some specimens these blue spots extend over lower, body purplish, stripe to anterior end of anal fin); pectoral fin bluish-green at base, the rest of the membrane colourless, but the rays dark-greenish, except a broad margin of ends of branched rays, red; ventral nearly colourless, tinged with pale purplish and bluish. Iris with orange, round pupil, with blue and green circles in middle, and outer orange circle. Length, 11 in. 7 lines; snout to orbit, 10 lines; snout to end of operculum, 2 in. 10 lines; snout to front of dorsal, 3 in.; depth of body, 3 in.; height of middle of dorsal, 1 in.; length of ventral, 1 in. 5 lines.

Reference.—Zool. Proc. 1840: Er. and Ter., Fish, p. 128, t. 56, f. 3-6.

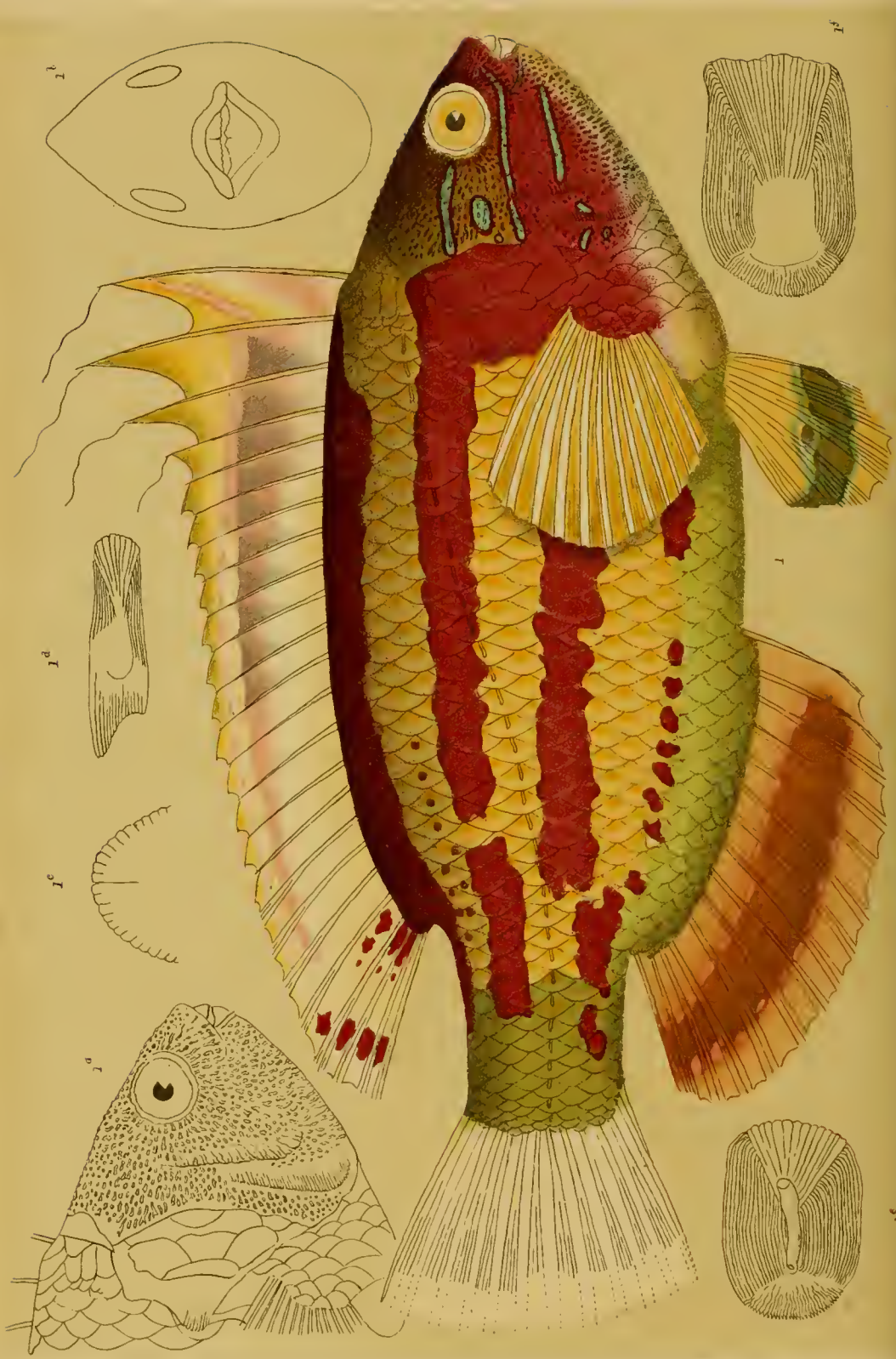
This is one of the most beautiful of all the Wrasses, called Parrot-fishes in Australia, and varies considerably in the extent of the blue spotting of the fins and in the intensity and extent of the body colours. I have not seen any vermilion line indicated in some of the second-hand, published descriptions of the colouring, and think the parts so named are always blue.

Not very uncommon in Hobson's Bay. Our specimens were got in February, August, and September. It has not been figured of the natural colours before.

Explanation of Figures.

Plate 163.—Fig. 1, average specimen, two-thirds of natural size. Fig. 1*a*, outline, to show granules, row of scales on cheek, and two rows with imperfect third row of large scales of operculum. Fig. 1*b*, teeth of upper and lower jaws, twice natural size, showing anterior large canines, and the posterior canines of upper jaw. Fig 1*c*, inner row of teeth in upper jaw, four times the natural size. Fig. 1*d*, scale from above lateral line, twice the natural size. Fig. 1*e*, scale from lateral line, twice the natural size. Fig. 2, dorsal fin of another specimen.

Frederick McCoy.



A. Bartrum lith. et del.

Prof. M.c Coy direxit

Steam lith. 100 Primary Office

PLATE 164.

HETEROSCARUS MACLEAYI (McCOY).

MACLEAY'S WRASSE.

[Genus HETEROSCARUS (CASTLENAU.) (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostei. Order Acanthopterygii. Sub-order Pharyngognathi. Family Labridæ.)

Gen. Char.—Upper jaw longer than the lower; teeth united together, forming a sharp cutting edge on both sides, with a distinct median suture in upper jaw; indistinct or none in lower jaw. Scales large; 14 to 16 spinous rays in dorsal; head without scales, granular and porous; cheeks with imbedded, impressed non-imbricating scales; large scales on operculum; lateral line continuous. Australia.]

D. 16 + 8; A. 2 + 13; C. 14; P. 13; V. 1 + 4; L. lat. $33\frac{5}{10}$.

DESCRIPTION.—Body oblong, compressed, height twice and two-thirds in total length (without caudal); length of head nearly three times in same length; thickness twice and a half in depth. Head semi-oval; upper pair of anchylosed sets of teeth overlapping the under pair; angle of mouth not reaching level of anterior edge of orbit. Three rows of large scales on the operculum; edge of operculum membranous and smooth, except at angle, which is striated; anterior part granular and porous; margin of preoperculum striated, edge serrated; all the pieces of the head with irregular, coarse granules; forehead between the eyes very slightly convex. *Fins:* Dorsal commencing at back of head, of 16 spinous and 8 jointed, branched rays, first four rays longest and terminating in long, very slender, flexuous filaments; jointed rays longer than immediately preceding spinous rays. Anal commencing under about the tenth dorsal ray, of 2 spinous and 13 jointed branched rays, terminating slightly behind the dorsal; caudal of 14 rays (shape uncertain). Ventrals ovate, of 1 spine and 4 branched rays. Pectoral large, ovate, of 13 rays. *Scales:* Large, rhombic, with concentric wrinkles of growth and very fine, longitudinal, rough flexuous striæ, serrating the posterior edge; 33 along lateral line; 5 above lateral line at middle of body and 10 below. *Colour:* Head clouded with indian-red and olive-green, passing to yellow ochre on throat; one narrow band of ultramarine-blue, edged with blackish-blue, extends with an upward curve from middle of lip, touching bottom of orbit, and extending straight towards upper base of pectoral, but not extending beyond the granular part of head on to the scales of operculum, which are dull indian-red; another, similar, blue streak goes from angle of mouth, a little beyond vertical of posterior edge of orbit, with a few, irregular, broken streaks or spots, to beyond edge of preoperculum; a third, similar streak extends backwards from middle of posterior edge of orbit to end of granular surface; one or two elongate, similar spots between this upper and the middle streak. Body with three broad, longitudinal stripes of rich indian-yellow, the spaces between which, and also the back, of a rich, reddish, purple, brown, madder colour (like lees of red wine), these three lateral stripes broken into spots at their posterior end, clouded on the back, and spotted with green; belly and end of tail sap green; all the fin rays green, except the pectoral, which has them orange-yellow with colourless membrane; ventrals greenish at base and margin, with a broad intermediate band of dark green beyond middle, edged with narrow margins of opal blue, like streaks of head; anal green at base, then dull orange, which is also at margin; a broad intermediate band

of dull reddish colour of body, edged above and below with narrow peach-blossom colour, breaking into some small spots at posterior end. Anterior part of dorsal dull orange-yellow at margin, pinkish and purple below, with a narrow band of peach-blossom colour edged with purple below the margin; posterior portion greenish at base, irregularly blotched with dark red; all the rays dull green. Iris dull orange.

Measurements.	Ins.	lines.
Length from tip of snout to base of caudal	9	3
„ „ „ anterior edge of orbit	0	9
„ „ „ end of opercnlum	3	0
„ „ „ base of pectoral	2	6
„ „ „ first dorsal spine	2	5
„ „ „ base of ventral	3	4
„ „ „ first spine of anal	5	6
„ „ „ last ray of dorsal	7	6
Depth of body	3	6
Length of 1st dorsal spine	2	0
„ filaments beyond ditto	0	9
„ last ray of dorsal	1	9
„ pectoral	1	9
„ ventral	1	7
„ first spine of anal	1	0
„ last ray of anal	1	6
Diameter of eye	0	6
Space between eyes	0	9

Three scales in a space of six lines at middle of body.

The *Heteroscari* are among the rarest and most beautiful of the Victorian "Wrasses," as somewhat similar fishes are popularly called in England. The present species, like the *H. filamentosus* (Cast.), has very long flexible filaments terminating the four first dorsal spines, but it differs from it and the other known species, in the number of the fin rays, number of the scales, and in the colouring. The lower jaw group of anchylosed teeth is not so distinctly divided as the upper, but still has a distinct suture near the margin, although becoming a mere shallow groove towards the base.

The form of the posterior edge of tail is uncertain from having been broken in the figured specimen, but was probably slightly notched like the other species.

I have only seen one specimen, the one figured, from Portland.

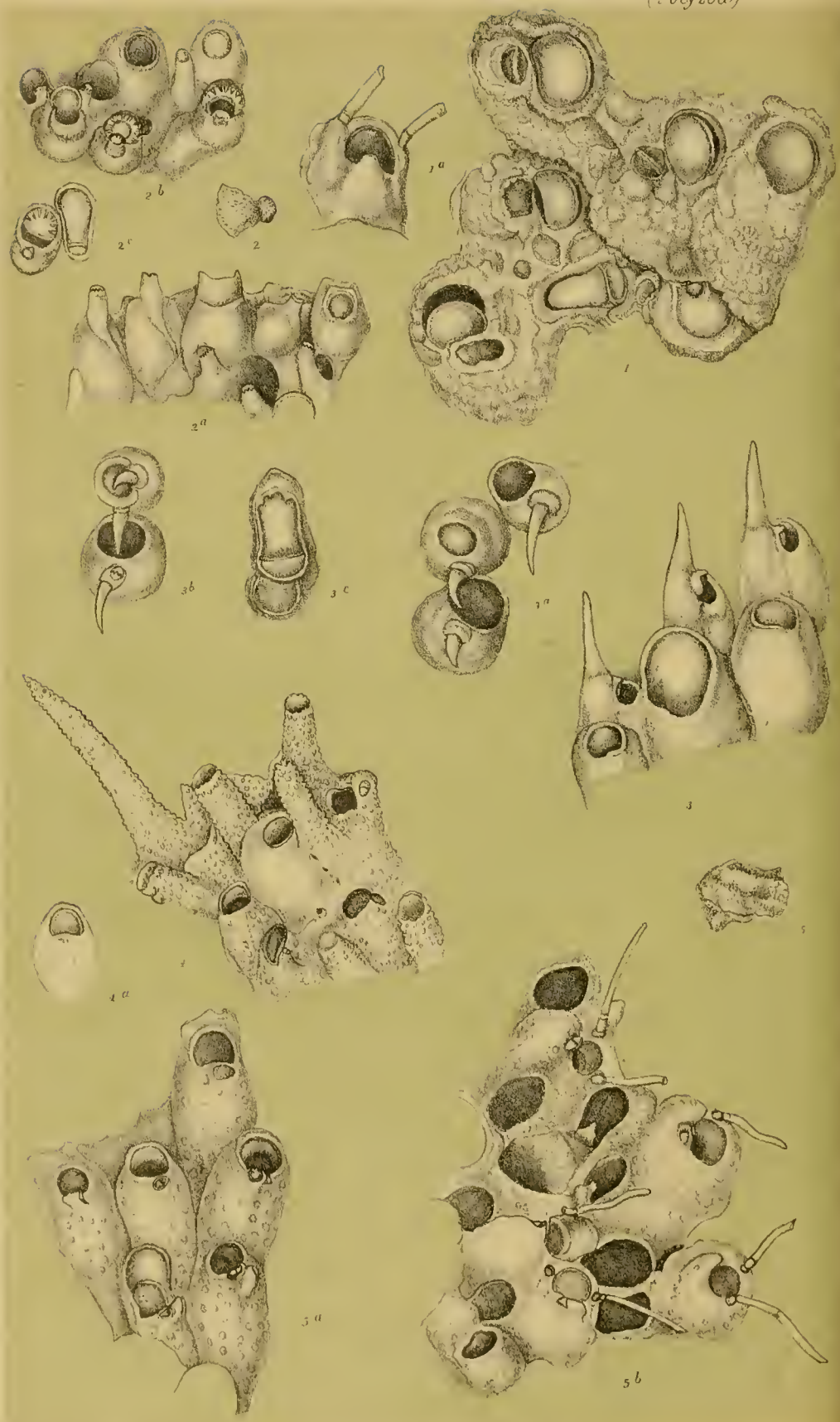
Explanation of Figures.

Plate 164.—Fig. 1, side view, three-fourths natural size. Fig. 1*a*, outline of head, to show pitting and granulation of anterior part, the striation and serration of margin of preoperculum, and the rows of large scales on posterior part of operculum, natural size. Fig. 1*b*, front view of head, showing anchylosed teeth, natural size (the lower suture should be a little longer). Fig. 1*c*, inside view of front edge of upper jaws, showing the anchylosed teeth united into two pieces, divided by the median suture, magnified two diameters. Fig. 1*d*, scale from base of anal fin, twice the natural size. Fig. 1*e*, scale from above lateral line, twice the natural size. Fig. 1*f*, scale from lateral line, twice the natural size.

Frederick McCoy.

165
Callep.

(Polyzoa.)



h. Macgillivray del
J. Pepper lith
Prof. M.c Coy direxit
Steam Litho. Govt. Printing Office

PLATE 165, FIG. 1.

CELLEPORA SIMPLEX (McG.).

[Genus CELLEPORA (FABRICIUS). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Celleporidæ.)

Gen. Char.—Zoarium crustaceous, adnate or glomerulous, or foliaceous and partly free, or massive or ramose. Zoœcia erect and confused in the central parts, decumbent at the growing edges; lower lip straight or nearly so and entire; one or more rostral processes, usually bearing avicularia, in the neighbourhood of the mouth, but sometimes absent; usually numerous vicarious avicularia of various forms, frequently raised on calcareous elevations.*]

DESCRIPTION.—Zoarium encrusting or adnate. Zoœcia large, nearly vertical, slightly projecting; mouth very large, semi-circular above, with a wide, very slightly arched lower lip; occasionally a slightly elevated, broad mucro below the mouth, with a small triangular avicularium having a smooth or serrated beak, or replaced by a large, broad avicularium; in some young zoœcia, a short, articulated spine on each side of the mouth. Vicarious avicularia with moderate sized, broadly ligulate mandibles.

Port Phillip Heads.

The specimen from which the figures have been taken is recumbent, measures $4\frac{1}{2}$ by 3 in., and numerous layers have been superposed on the upper surface until at one part the thickness is nearly half an inch. Below the mouth is sometimes a mucro with a small avicularium, or an avicularium of much larger size without a mucro, as in the figure. The colour is brown.

EXPLANATION OF FIGURES.

PLATE 165.—Fig. 1, showing zoœcia with large avicularia below the mouth, and vicarious avicularia. Fig. 1*a*, single zoœcium near growing edge, showing mucro and articulated spines.
PLATE 168.—Fig. 7, Chitinous parts.

PLATE 165, FIG. 2.

CELLEPORA DIADEMA (McG.).

DESCRIPTION.—Zoarium small, adnate, yellow. Zoœcia short, nearly horizontal at the growing edge, more vertical internally; mouth sub-circular; in many of the younger zoœcia a sub-oral columnar mucro, carrying on its apex a small avicularium

* The genus *Cellepora* has been divided into the sections *holostomata* and *schizostomata*, the first with the lower lip entire, and the inferior edge of the operculum straight, the second with the lip fissured, and the operculum with a corresponding rounded or tongue-shaped process. It seems to me that these distinctions ought to be considered generic, as in other similar groups; and I would retain the name of *Cellepora* for the former and propose that of *Schismopora* for the latter. The *Celleporæ* are usually of large size, massive, decumbent or erect, or bilaminate and variously branched. The *Schismoporæ*, on the contrary, are mostly of small size, although occasionally large, as *S. megasoma* and *S. (Cellepora) Eytonensis* (Busk), and are frequently glomerular.

with a serrated beak; older zoœcia, especially the fertile, with the peristome of the lower lip produced forwards and frequently with a short columnar process, surmounted by an oval avicularium. Oœcia globular, reclinate, with a semi-circular area in front, bounded by a narrow raised line, along the margin of which is a series of short, concentric, triangular marks. Scattered vicarious avicularia with spatulate mandibles.

Port Phillip Heads, a single specimen, Mr. J. Bracebridge Wilson.

The aviculiferous process in the young marginal zoœcia has considerable resemblance to the semi-spiral tube in *Lagenipora nitens*, which possibly ought to be referred to this genus.

EXPLANATION OF FIGURES.

PLATE 165.—Fig. 2, specimen, natural size. Fig. 2*a*, young zoœcia. Fig. 2*b*, older zoœcia and oœcia. Fig. 2*c*, oœcium and vicarious avicularium.

PLATE 165, FIG. 3.

CELLEPORA SPICATA (McG.).

DESCRIPTION.—Zoarium forming bilaminate folds. Zoœcia at the growing margin nearly horizontal, oval or barrel-shaped, smooth or very minutely and sparsely granular; mouth semi-circular, nearly straight below; a long, sharply conical rostrum projecting from one side of the lower lip, with a small avicularium overhanging a notch at the base. In older parts the zoœcia nearly vertical, very much confused; a short pre-oral rostrum with basal avicularium; sometimes a long, trumpet-shaped rostrum, surmounted by an avicularium, from the side of the mouth; occasionally more than one rostrum and sometimes the mouth unarmed, semicircular or oval, and with the part below the lower lip thin and projecting. Oœcia cucullate, sub-immersed, smooth, a conical rostrum rising from a thickened base on the anterior surface over the middle of the marginal lip, with a small avicularium (frequently absent) at the base.

Port Phillip Heads.

EXPLANATION OF FIGURES.

PLATE 165.—Fig. 3, zoœcia from growing edge. Figs. 3*a* and 3*b*, zoœcia and oœcia from the central parts. Fig. 3*c*, vicarious avicularium.

PLATE 168.—Fig. 8, opercula.

PLATE 165, FIG. 4.

CELLEPORA CIDARIS (McG.).

DESCRIPTION.—Zoarium adnate. Zoœcia ovate, very irregularly arranged; surface finely granular; mouth straight below; below the mouth, at one side, a horizontal elevation, at the inner extremity of which is an avicularium with a small semicircular mandible and serrated beak. At the front of or between the zoœcia are numerous tall, stout, hollow, erect, acuminate or blunt processes, thickly and strongly granular or tubercular on the surface. Oœcia of moderate size, globular, sub-immersed.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

EXPLANATION OF FIGURES.

PLATE 165.—Fig. 4, portion magnified, showing the large processes, several of which have been broken across. Fig. 4*a*, single young zoœcium.

PLATE 165, FIG. 5.

CELLEPORA BISPINATA (BUSK).

DESCRIPTION.—Zoarium encrusting. Zoœcia long, distinct at the growing edge, irregularly heaped and confused in other parts, ovate, granular; mouth at first with a straight lower lip, beneath which is subsequently developed a small or, occasionally, a large blunt mucro, on the inner surface of which is situated a small avicularium with the rounded mandible pointed downwards; a long, stout, articulated spine on each side of the mouth above. Oœcia sub-globular, granular.

REFERENCE.—Busk, Brit. Mus. Cat., Mar. Pol., pt. ii., p. 87, pl. cxx., figs. 1, 2.

Port Phillip Heads; Portland, Mr. Maplestone; Warrnambool, Mr. Watts.

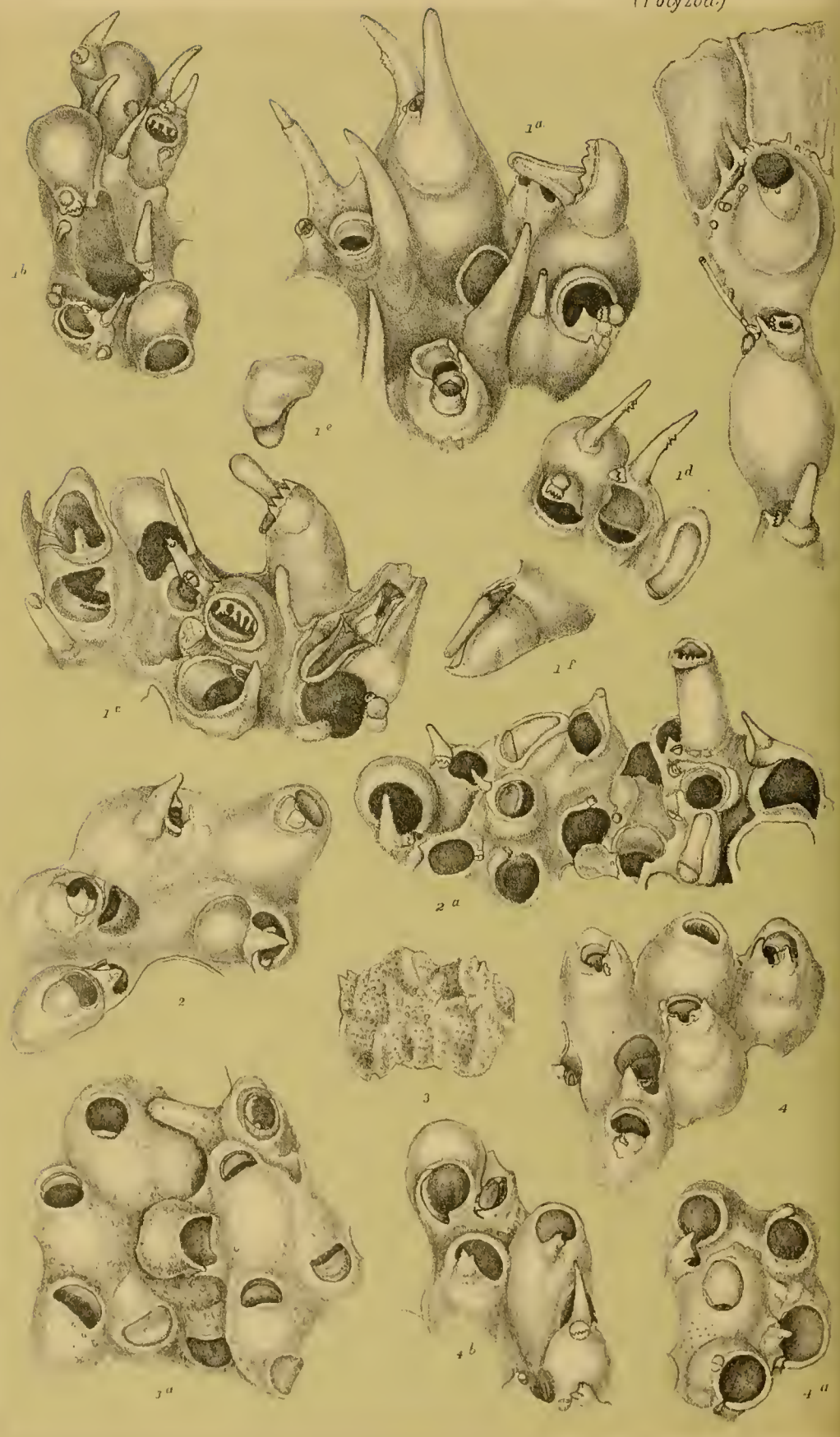
There can, I think, be no doubt that this is the species described by Busk, and that it has no connection with the *Discopora albirostris* of Smitt, as supposed by that author, from which it is readily distinguished by the oral spines being distinctly articulated, and by the rostrum being short and blunt.

EXPLANATION OF FIGURES.

PLATE 165.—Fig. 5, specimen, natural size. Fig. 5*a*, portion from growing edge of same, magnified. Fig. 5*b*, portion from older part, showing also a commencing and fully formed oœcium.

PLATE 168.—Fig. 9, operculum.

(Polyzoa.)



P H Macgillivray del.
J Ripper lith.
Prof. M.c Coy direxit
Steam. litho Gov.t Printing Office

PLATE 166, FIG. 1.

CELLEPORA VERRUCOSA (McG.).

DESCRIPTION.—Zoarium expanded, adherent or partially free; surface nodulated, and covered with narrowish verrucose elevations; colour brown. Marginal zoœcia recumbent, elongated, smooth, distinct at the extreme margin, farther back with the edges fused together; primary mouth arched above, straight below, with two short, stout, rigid spines; subsequently the sub-oral portion of the zoœcium largely projecting, and a long thin pre-oral rostrum becoming developed to one side of the lower lip, having a deep notch at its base, with an avicularium with oval mandible mostly turned inwards; in older parts of the zoarium the zoœcia more vertical and confused, the lower lip with a row of serrated denticles internally. Oœcia globose, not very prominent. Vicarious avicularia on stout, columnar elevations, with large spatulate mandibles and usually serrated beaks.

Portland, Mr. Maplestone.

The only specimen I have seen measures $5\frac{1}{2}$ by 3 inches, and is of a light brown colour. It is thick, from the superposition of several layers. The surface is covered with verrucose ridges and separate verrucose or mamilliform elevations. The mouth of the fully formed zoœcium is usually smooth and slightly hollowed below, and there is internally a row of simple or serrated denticles, usually obscured by the peristome. The oral rostrum frequently has a serrated projection about half-way towards the summit, probably concealing an avicularium. The vicarious avicularia are of large size, usually elevated on thick columns, with long, broadly ligulate or spatulate mandibles closing on strongly serrated beaks. The oœcia are rounded and occasionally have a conical spine, with or without an avicularium at its base, on the anterior surface.

An inspection of the figures, from different parts of the same specimen, well illustrates the protean characters which may be found in a single species of this difficult genus. The serrated denticles inside the lower lip are usually concealed by the growth

of the peristome, and thus seem to be absent. Of the large vicarious avicularia, also, some have the beaks smooth, while others have them strongly serrated.

Explanation of Figures.

Plate 166.—Fig. 1, zoœcia at growing edge. Fig. 1*a*, a portion farther back, showing oral processes and a vicarious avicularium with strongly serrated beak. Figs. 1*b* and 1*c*, other portions showing denticulate mouths of zoœcia and oœcia. Fig. 1*d*, two oœcia with anterior rostra. Figs. 1*e* and 1*f*, vicarious avicularia with smooth rostra.

Plate 168.—Fig. 15, chitinous parts.

Plate 166, Fig. 2.

CELLEPORA FOLIATA (McG.).

Description.—Zoarium large, base broad and loosely adnate, raised into irregular, thick, erect, bilaminate lobes, anastomosing and frequently perforated at the base; edges irregular and surface verrucose or irregularly mamillated. Marginal zoœcia nearly horizontal, rather short; older zoœcia vertical, confused, close; mouth deep, straight or slightly hollowed below; operculum light coloured; pre-oral rostrum, on younger zoœcia, with a small, overhanging avicularium with denticulate beak, produced into a moderate sized conical process. Vicarious avicularia with ligulate or long triangular mandibles, and usually uncinate and denticulate beaks; occasionally an avicularium with a very narrow mandible situated on the summit of a tall, thick column.

Portland, Mr. Maplestone.

The specimen I have measures 7 inches by 4, and the height of the highest foliations is 3 inches. It is of an ashy-grey colour. The base is broad and almost entirely covered by the thick, erect lobes which run in a sub-parallel direction across the zoarium. These are more numerous and of much greater size and thickness than in *C. prolifera*, from which also it differs somewhat in the structure of the operculum.

Explanation of Figures.

Plate 166.—Fig. 2, young marginal zoœcia. Fig. 2*a*, zoœcia from older part of same specimen, showing also growing oœcia, sessile vicarious avicularia, and small avicularium on thick column.

Plate 168.—Fig. 10, operculum.

PLATE 166, FIG. 3.

CELLEPORA INTERMEDIA (McG.).

DESCRIPTION.—Zoarium loosely adnate or partly free. Zoœcia large, confused, oblique or nearly horizontal, faintly granular; mouth large, straight below; rostrum usually wanting, but in some zoœcia existing as a small elevation below the mouth, with a conspicuous avicularium on the side. Oœcia small, globular, sub-immersed, faintly granular. Vicarious avicularia scattered irregularly, with large spoon-shaped mandibles.

REFERENCE.—P. H. MacGillivray, Trans. Roy. Soc. Vict., 1868.

Queenscliff.

EXPLANATION OF FIGURES.

PLATE 166.—Fig. 3, specimen, natural size. Fig. 3*a*, portion magnified.

PLATE 166, FIG. 4.

CELLEPORA PROLIFERA (McG.).

DESCRIPTION.—Zoarium expanded, loosely adnate, surface verrucose and raised into thin, bilaminate, ligulate or wider ridges expanding upwards. Marginal zoœcia horizontal, barrel-shaped; central zoœcia confused, immersed; mouth nearly straight below; pre-oral rostrum with a small avicularium at one side of a sinus of the peristome, and a very short, conical process; this process frequently absent, and the avicularium then situated on one side of the oral sinus. Oœcia globular, smooth or finely granular.

Portland, Mr. Maplestone.

Of a reddish or yellowish-brown colour. The largest specimen I have examined measures 6 by 4½ inches in diameter. It occurs as a comparatively thin, loosely adnate crust, covered with rounded mamillary projections. These projections usually expand upwards, the sides anastomosing with others so as frequently to leave spaces bridged over by their junction.

EXPLANATION OF FIGURES.

PLATE 166.—Fig. 4, growing edge, magnified. Figs. 4*a* and 4*b*, other portions of the same specimen.

PLATE 168.—Fig. 11, opercula.

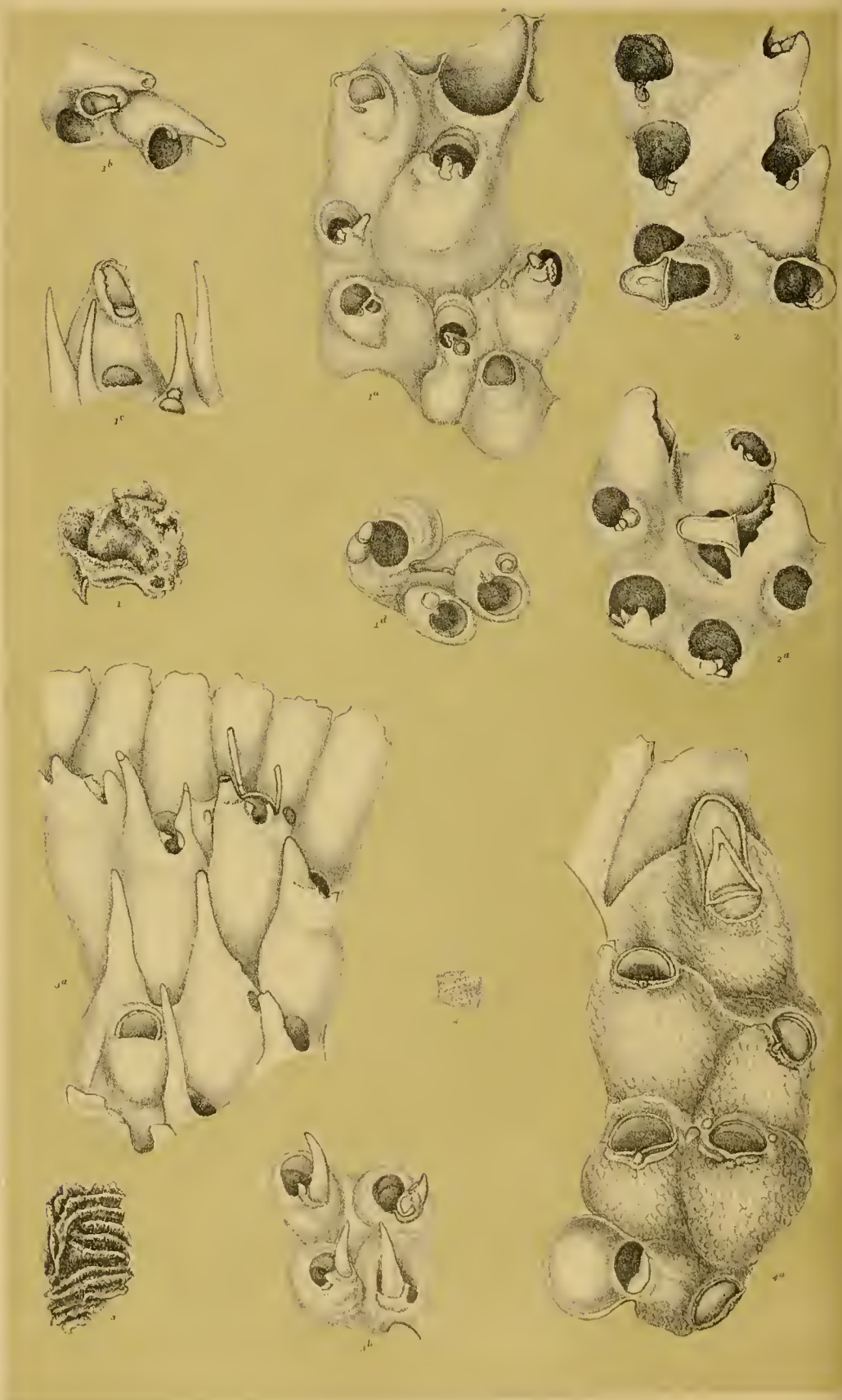


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PLATE 167, FIG. 1.

CELLEPORA ALBIROSTRIS (SMITT).

DESCRIPTION.—Zoarium encrusting, or adnate, or partly free, of a white or greyish-brown colour. Marginal zoœcia horizontal, ovate, distinct, smooth; mouth lofty, arched above, straight below; at first plain, but subsequently a transverse process originating from one side below the mouth, carrying a small avicularium at its inner end, external to which it gives rise to a conical spine which is at first short, but with growth attaining a considerable height, and frequently with the adjacent part of the zoœcium enlarged; older zoœcia more erect and confused, but with the same structure. Oœcia sub-globose. Vicarious avicularia on calcareous elevations, with large, broadly ligulate mandibles closing on serrated beaks.

REFERENCES.—*Discopora albirostris*, Smitt, Floridan Bryozoa, pt. ii., p. 70, pl. xii., figs. 234–239 = *Cellepora albirostris*, Busk, Challenger Polyzoa, pt. i., p. 193, pl. xxxiv., fig. 7, and pl. xxxv., fig. 3.

Port Phillip Heads.

I have considerable doubt whether this is identical with Smitt's and Busk's species. All my specimens are encrusting or fixed to roots of *Laminariæ*. None of them show the two long, slender, rigid, oral spines figured by Smitt and Busk, but the former remarks that they are sometimes wanting. The pre-oral rostra are also thicker. The opercula are usually, as mentioned by these authors, of a dark colour, and contrast strongly with that of the zoarium. The shape, however, differs from Busk's figures.

EXPLANATION OF FIGURES.

PLATE 167.—Fig. 1, specimen, natural size. Fig. 1*a*, zoœcia, from the growing margin, magnified. Fig. 1*b*, two zoœcia and small vicarious avicularium. Fig. 1*c*, vicarious avicularium, mouth of zoœcium, and several pre-oral rostra from others. Fig. 1*d*, zoœcia and oœcium, from central part.

PLATE 168.—Fig. 12, operculum.

PLATE 167, FIG 2.

CELLEPORA FUSCA (BUSK).

DESCRIPTION.—Zoarium, very much lobed, the lobe bilaminate, narrowed at the base and wider above. Marginal zoœcia ovate, distinct, smooth; primary mouth entire, but becoming notched from the growth of a transverse process having a

small avicularium, with a rounded mandible and serrated beak overlooking the notch, and a conical rostrum posteriorly. Vicarious avicularia large, on the side of thick calcareous elevations; mandible large, broadly ligulate, and closing on strongly serrated beaks.

Reference.—Busk, Brit. Mus. Cat., Mar. Pol., pt. ii., p. 88, pl. cxix., fig. 2, and pl. cxx., fig. 6.

Portland, Mr. Maplestone.

The specimen figured forms a laminated mass, $1\frac{1}{4}$ by 2 inches, and is growing on a branch of a slender dark alga.

Explanation of Figures.

Plate 167.—Fig. 2, portion from the growing edge. Fig. 2*a*, more central portion, showing also two large avicularia.

Plate 168.—Fig. 16, chitinous parts.

Plate 167, Fig 3.

CELLEPORA LIRATA (McG.).

Description.—Zoarium flat and adherent, or loosely adnate, or encircling stems of algæ or zoophytes, raised into usually regular sharp ridges, with deep furrows between; the extreme summits of the ridges forming a sort of crimped edge. Zoœcia towards the summits of the ridges elongated; mouth elongated, two spines (usually absent) above, a rostrum on each side, one very large and produced into a long, tapering process, and having towards its base an overhanging avicularium; the other rostrum (frequently absent) smaller, and usually with a similar avicularium; zoœcia in the furrows confused, nearly vertical, thicker, and having usually only one rostrum, with an overhanging avicularium.

Port Phillip Heads.

This species is usually readily distinguished by the manner in which the zoœcia are disposed in sharp ridges, separated by deep furrows. In some specimens, however, especially those not encircling other objects, but flat and adherent or adnate, the ridges are short, interrupted, not so high, and more resembling the elevations of *C. mamillata*. The extreme summits are produced into a thin, frilled, sharp edge, as occurs in *Densipora corrugata*, to which the mode of growth in many specimens is remarkably similar. It is allied to *C. albirostris*.

Explanation of Figures.

Plate 167.—Fig. 3, specimen, natural size. Fig. 3*a*, side view of the edge of one of the ridges, magnified. Fig. 3*b*, zoœcia, from a furrow.

Plate 168.—Fig. 14, operculum.

PLATE 167, FIG. 4.

CELLEPORA MAGNIROSTRIS (McG.).

DESCRIPTION.—Zoarium small, encrusting, or partially free. Zoœcia large, ovate, distinct, separated by deep grooves, surface granular; mouth straight or slightly sinuous below; immediately below the lip an irregular thickened band, with a small elevation in the middle (possibly an aborted avicularium); a long, articulated spine (frequently absent) on each side of the mouth. Oœcia globose, smooth. Numerous scattered, vicarious, much raised avicularia, the rostrum with a smooth or serrated margin, and the mandible crossed by a triangular chitinous band.

Port Phillip Heads.

Evidently allied to *C. bispinata*, but differing in the absence of distinct rostrum with avicularium, and the structure of the large vicarious avicularia. In the figured specimen the oœcium is smooth, and surrounded by a distinct rim; in other and probably older specimens there is no rim.

EXPLANATION OF FIGURES.

PLATE 167.—Fig. 4, specimen, natural size. Fig. 4*a*, portion magnified, showing zoœcia, oœcium, and large avicularium. The avicularia are usually broader below the sharper point, so as to have a hastate shape.

PLATE 168.—Fig. 17, operculum.

My friend Mr. MacGillivray has presented all the type specimens and descriptions of the species of the very important and difficult genus *Cellepora*, represented on plates 165 to 168, and made the drawings for the lithographer, so as to insure the accuracy which can scarcely be got by the aid of the most skilful artist other than the naturalist actually defining the species; and the Museum and this work are very greatly indebted to him for the complete illustrations of those Polyzoa, which could not otherwise have been presented to the public.

FREDERICK McCOY.

(Polyzoa)

P.H. Macgillivray del.
J. Ripper lith.

Prof. M.c Coy direx.t

Steam Litho Gov.t Printing Office

PLATE 168.

CHITINOUS PARTS OF SPECIES OF CELLEPORA.

FIG. 1, C. GLOMERATA.

2, C. PLATALEA.

3, C. COSTATA.

4, C. MEGASOMA.

5, C. VITREA. (The specimen from which these chitinous parts were taken differs in some respects from that figured.)

6, C. TIARA.

The foregoing species belong to the proposed new genus *Schismopora.*

FIG. 7, C. SIMPLEX.

8, C. SPICATA.

9, C. BISPINATA.

10, C. FOLIATA.

11, C. PROLIFERA.

12, C. ALBIROSTRIS.

13, C. SERRATIROSTRIS.

14, C. LIRATA.

15, C. VERRUCOSA.

16, C. FUSCA.

17, C. MAGNIROSTRIS.

(*Mollusca*)

D^r J J Wild del et lith. Prof^r M^c Coy direx^t. Steam Litho Gov^t Printing Office

D^r J J Wild del et lith Prof^r M^c Coy auct Steam Litho Govt Printing Office

PLATES 169 AND 170.

OMMASTREPHES GOULDI (McCOY).

GOULD'S SQUID.

[Genus OMMASTREPHES (D'ORB.). (Sub-kingdom Mollusca. Class Cephalopoda. Sub-class Antipedia. Order Sephinia. Family Onychoteuthidæ.)

Gen. Char.—Head short, depressed, cylindrical, suddenly narrowed behind the eyes; eyes large, lateral, without skin covering, with a transversely oval external opening, having a large sinus in upper edge; buccal membrane large, 7-lobed, without suckers. Body elongate, cylindrical, tapering abruptly behind, truncated in front; cartilages on base of siphon contracted, and with a tubercle on each side below, forming a triangle, with a narrow internal cavity above, and a wide transverse one below, into which corresponding hard tubercles from inner sides of mantle fit, and extending into a transverse ridge towards each other; two longitudinal ridges on nape, with concavity between, on a hard oblong plate, fitting into corresponding parts on inside of mantle; three longitudinal keels on each side of narrowed posterior portion of head, one containing the opening of the ear. Two large aquiferous openings, between the 3rd and 4th pair of sessile arms, outside the tentacular long arms; four buccal cavities, two between the 1st and 2nd pair of sessile arms, and two between the 3rd and 4th pairs. Two anal cavities, one on each side of base of siphon. Siphon lodged in hollow in head, with a valve, and supported by four ligaments, two inner ones thin, two outer thicker. Suckers pedunculated, with very oblique, toothed, corneous margins; two rows on sessile arms, with teeth on upper edge, and four rows on distal end of long pair, with teeth all round larger ones. Long tentacular arms not retractile, only moderately dilated towards distal end, with a small membranous crest on midline of back, and a membranous margin outside the four rows of suckers; the two inner rows of suckers very large, two outer rows very small. A connecting membrane between the 3rd and 4th pair of arms only. Fins terminal, rhomboidal. Internal dorsal pen narrow, slightly widened in front, narrowing gradually towards posterior end, which slightly dilates and ends in a simple conical cavity; the margins and midline are thickened ridges.]

DESCRIPTION.—Body long, cylindrical for half its length, or nearly to origin of fin, and thence rapidly and abruptly tapering to posterior end. Fin slightly obtuse; lateral angles 100°, about $\frac{2}{5}$ths the length of body to edge of mantle. Sessile arms, 2nd pair equalling the 3rd, 1st pair equalling the 4th; dorsal and ventral pairs equal, and smaller than the second and third pairs, which are equal to each other; third pair compressed, triangular in section, wider and more compressed than the others, with a membranous border (three lines wide) on ventral edge, and one-half the width on the other edge; the other arms without membranous borders. Suckers in two rows, with 9 to 11 teeth on higher part of oblique edge, lower part of edge smooth. Two tentacular arms as long as body, lanceolate and slightly dilated towards distal end, tapering to extremity, with a prominent membranous keel on back of distal portion; suckers of two large, middle rows, with 15 teeth all round each; small suckers of two outer rows with 20 teeth, smaller on lower edge; apical inch and half with 4 rows of small, sub-equal suckers, then 3 inches on which the 8 suckers of each middle row are very much larger than the rest, and then for 2 inches the suckers are small, sub-equal, and in two rows only. Internal pen as long as mantle, acutely angular (at 50°) at widest anterior end, which, in figured specimen, is 6 lines wide, gradually tapering to 1 line wide at 9 inches from tip; then widening again in middle of

posterior two inches, tapering to posterior end, where sides join to form posterior hollow cone, 6 lines long. A supplementary piece of same consistence as pen, and of the same size and shape at anterior end, is attached to anterior end of pen, gradually tapering thence to a narrow posterior end at 1 in. 9 lines long; mid-rib and lateral ribs as in pen. *Colour*: General line of back pale purplish-red from minute chromatophore spots of two sizes; a narrow, definite, dark-purplish band along middle of whole length of body, a wide triangular patch of same colour on each side of head, the base at edge of eye; and a narrow band of same colour along back of each sessile arm; underside similarly dotted with redder and paler spots; suckers and siphon white. Besides the dots, the whole body gleams with the most beautiful, iridescent, opaline, delicate tints of blue, green, and pink; the same colours being stronger round the eye, the centre of which is dark-brown. *Measurements:* Length from base of sessile arms to posterior tip, 13 ins. Proportional measurements to this, as 100: Width of body at middle, $\frac{23}{100}$; at upper edge of fin, $\frac{19}{100}$; at middle of fin, $\frac{5}{100}$; width from lateral angle of one fin to the other, $\frac{47}{100}$; length of tentacular arms, $\frac{80}{100}$; length of sessile arms, 1st dorsal pair $\frac{42}{100}$, 2nd pair $\frac{50}{100}$, 3rd pair $\frac{48}{100}$ to $\frac{50}{100}$, 4th or ventral pair $\frac{42}{100}$; width of head, $\frac{20}{100}$; greatest longitudinal extent of fin, $\frac{35}{100}$; length of body from edge of mantle to posterior end, $\frac{80}{100}$.

The present species agrees with the *Loligo (Ommastrephes) equipoda* of Rüppel in having the sessile arms of two sizes only, but has larger fins. It nearly resembles the *O. insignis* of Gould in shape, but the relative lengths of the sessile arms distinguish it, as well as the obtuse angles of the fins, &c. I suppose the pen described and figured by Gould for *O. insignis* must be imperfect behind and must have lost its generic cone; also the replacement of the suckers by tubercles on bases of two of the arms in some specimens is, I suppose, accidental. The *O. Sloani* (Gray) is stated to have the sessile arms compressed, the third pair acutely finned, with a narrow-rayed membrane on inner edge only of ventral side; the seventh pair of central series of suckers on tentacular arms largest, in which respect it differs from the present species.

The Cuttlefishes forming the genus *Ommastrephes* are distinguished from the *Loligo*, with which they were formerly confounded, by the eyes not being covered by skin; by the lachrymal sinus in upper edge of eyelid; by the four, instead of six, buccal cavities; the hollow in head for siphon, and its having four, instead of two, suspenders; the tentacular arms not being retractile, &c., and the narrow pen with conical cup at posterior end; the want of suckers on buccal membrane; and the lateral openings on base of siphon. They are all gregarious, inhabiting the mid-ocean, where they form the food of whales, porpoises, albatross, petrels, &c.

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Frederick McCoy.

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PLATES 169, 170.—Gould's Squid (Ommastrephes Gouldi, McCoy).

Natural History of Victoria.

PRODROMUS

OF THE

ZOOLOGY OF VICTORIA;

OR

FIGURES AND DESCRIPTIONS OF THE LIVING SPECIES OF ALL CLASSES

OF THE

VICTORIAN INDIGENOUS ANIMALS.

DECADE XVIII.

BY

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M DCCC LXXXIX.

ADVERTISEMENT.

It having been considered desirable to ascertain accurately the natural productions of the Colony of Victoria, and to publish works descriptive of them, on the plan of those issued by the Governments of the different States of America, investigations were undertaken, by order of the Victorian Government, to determine the Geology, Botany, and Zoology of the Colony, to form collections illustrative of each for the public use, and to make the necessary preparations for such systematic publications on the subject as might be useful and interesting to the general public, and contribute to the advancement of science.

As the geological and botanical investigations have already approached completion, and their publication is far advanced, it has been decided now to commence the publication of the third branch completing the subject, namely, that of the Zoology or indigenous members of the different classes of the animal kingdom.

The Fauna not being so well known as the Flora, it was a necessary preliminary to the publication to have a large number of drawings made, as opportunity arose, from the living or fresh examples of many species of reptiles, fish, and the lower animals, which lose their natural appearance shortly after death, and the true characters of many of which were consequently as yet unknown, as they had only been described from preserved specimens. A Prodromus, or preliminary issue, in the form of Decades, or numbers of ten plates, each with its complete descriptive letterpress, will be published, of such illustrations as are ready, without systematic order or waiting for the completion of any one branch. The many good observers in the country will thus have the means of accurately identifying various natural objects, their observations on which, if recorded and sent to the National Museum, where the originals of all the figures and descriptions are preserved, will be duly acknowledged, and will materially help in the preparation of the final systematic volume to be published for each class when it approaches completion.

Natural History of Victoria.

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M DCCC LXXXIX.

PREFACE.

The first plate in this Eighteenth Decade represents a newly-discovered, third species of Blue-tongued Lizard, *Cyclodus occipitalis*, very rare in Victoria, the only examples I have seen being from the North-Western District; remarkable for the great number and size of the occipital plates on the back part of the head.

The second plate shows one of the largest and most conspicuously coloured of our food fishes, the true Yellow-Tail, *Seriola Lalandi*.

The third and fourth plates show two of the many varieties of another of our large and often beautifully-coloured food fishes, the *Chilodactylus carponemus*, not figured of the natural tints before.

The next four plates continue our illustrations of Victorian Polyzoa, through the kindness of Mr. MacGillivray, whose extensive collection is given with the descriptions for the National Museum and this work.

Plates 179 and 180 give for the first time complete figures of the living colours, of both sexes, of the Great Red King-Crab of the Colonists, *Pseudocarcinus gigas*, which greatly exceeds in size and brilliancy of colour any other species of the family *Cancerida*.

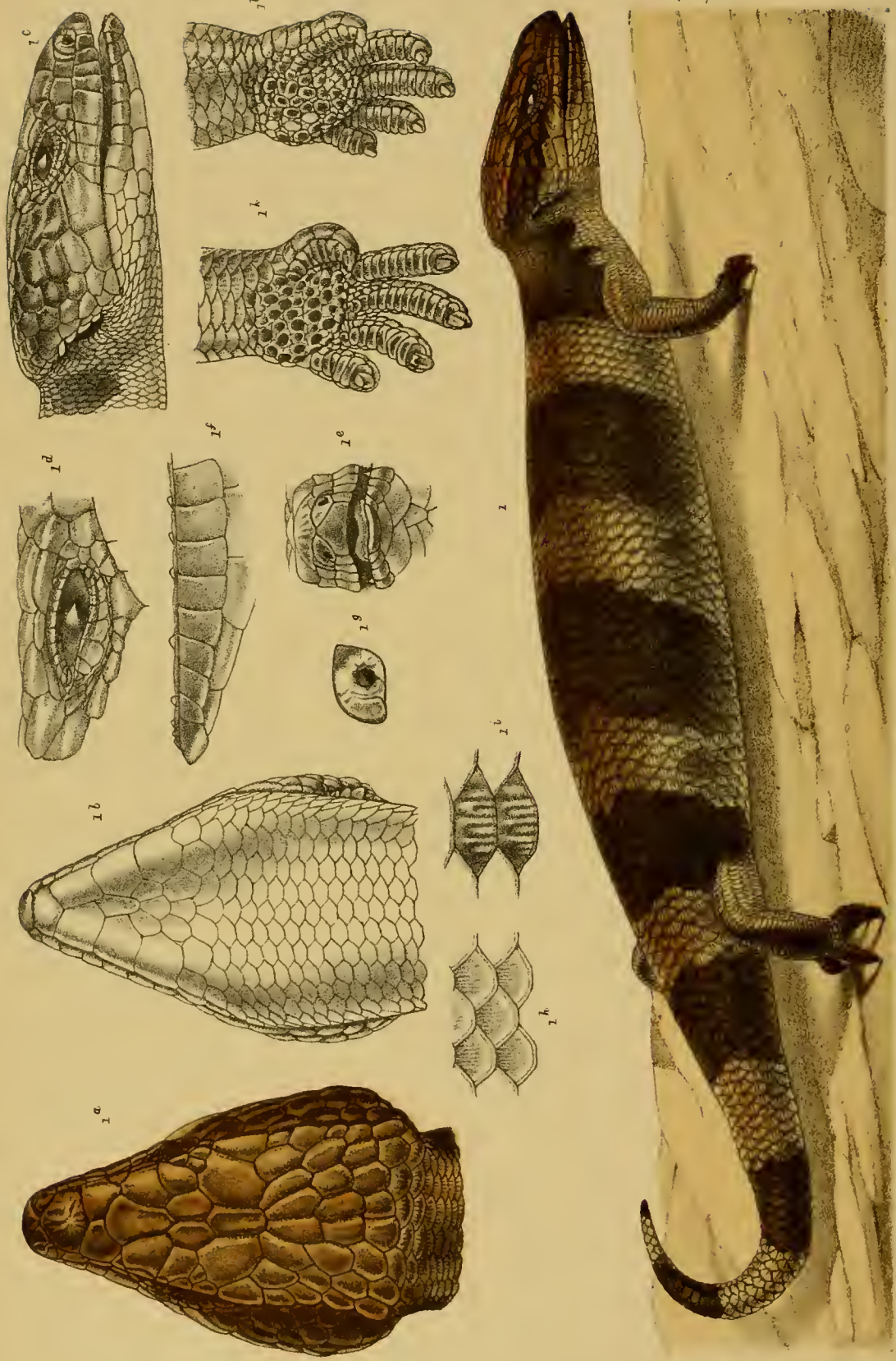
The succeeding Decades will illustrate as many different genera as possible, and deal first, usually, with species of some special interest and of which good figures do not exist or are not easily accessible.

FREDERICK McCOY.

25th May, 1889.

ZOOLOGY OF VICTORIA

(Reptiles)



D^r J J Wild del et lith.

Prof^r M^c Coy direct

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PLATE 171.

CYCLODUS OCCIPITALIS (PETERS).

THE BROAD-BANDED OR OCCIPITAL BLUE-TONGUE LIZARD.

[Genus CYCLODUS (WAGLER). (Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Sub-order Leptoglossæ. Tribe Geissosaura. Family Scincidæ.)

Gen. Char.—Form moderately thick, elongate, fusiform. Head large, thick, sub-trigonal, obtusely pointed in front. Neck short, thick. Head shields thick, rather rugose; nasal plates near the tip of snout, touching (or nearly) each other above, ovato-trigonal; nostril in centre of nasal plate, with a curved furrow bordering its posterior edge; internasal or prefrontal plate rhombic; no supranasals; frontonasals two, moderate, touching; frontal large, broad, obtuse-angled in front, narrow behind; two moderately large fronto-parietal plates; parietals large; interparietal resembling the frontal, and nearly as long, but much narrower, acute-angled in front; four superciliary plates over each eye, the second largest; about five rows of temporal plates between the eye and the ear; polygonal occipital shields in one or more transverse rows; orbit surrounded by a row of small plates; two or more frenal plates between the nasal plate and the orbit; lower eyelid scaly. Ear-opening large. Scales of back and sides bony, large, convex, subhexagonal, rugose, with obscure, diverging grooves; scales of belly thinner and smoother. Legs four, nearly equal, small, short, strong; feet small, each with five, short, cylindrical, subequal toes; subdigital plates undivided; claws short, thick. Tail short, slightly less than half of the total length, subcylindrical, very slightly compressed laterally, tapering, with rather thicker scales than the back of the body, and a central row of large, broad scales below. Tongue short, flat, scaly, slightly notched at the point. Teeth on edge of jaws, bluntly rounded; palate without teeth, with a triangular notch behind, extending forwards as far as middle of eye; palatine bones meeting in midline of palate.]

DESCRIPTION.—Head acutely angular, tip of snout obtusely rounded. *Cephalic plates:* Rostral hexagonal, separating nasals above, touching the heptagonal internasal or prefrontal (which does not touch the frontal, being separated from it by the junction of the two large frontonasals, which join by their inner edge), by anterior edge, second frenal plate by outer edge, first supraciliary by hind external edge, and frontal by hind internal edge; five superciliary plates, two middle ones narrowest and over eye; two large supra-ocular plates, anterior largest, subtrigonal or pentagonal, touching first three superciliary plates by outer edges, second supra-ocular and frontonasal by middle and inner hind edges, and frontal by inner edge; some specimens have a very small third supra-ocular wedged between the third and fourth superciliary plates, the second supra-ocular, and the parietal; hinder supra-ocular touches third and fourth superciliaries by outer edges, parietals by hind edge, and frontoparietals by inner edge: frontal large, tetragonal, width between anterior lateral angles equal to length from its anterior angle to anterior edge of internasal or prefrontal; length varying from equal to length from anterior angle to tip of snout at middle of rostral, to from same point to anterior edge of internasal; long lateral sides converging to posterior angle between the frontoparietals; frontoparietals small, subquadrate or pentagonal, touching each other in midline, frontal with inner anterior edge, anterior supra-ocular with anterior outer edge, posterior supra-ocular with posterior outer edge, interparietal with inner posterior edge, and parietal with outer posterior edge; parietals large, much longer and wider than frontoparietals; interparietal narrow, hexagonal, pointed behind (so that there is no azygous occipital plate); three or four transverse rows of pairs of occipital plates behind the interparietal, the first being

about four-fifths the length of the interparietal, the anterior temporals only slightly smaller than the second row; earopening with three or four large lobe scales projecting from anterior margin. Scales subhexagonal, or with posterior edge rounded on belly, smooth below, nearly smooth on back, in some specimens distinctly marked with from three to eight irregular longitudinal ridges, which are either straight and simple, or branching and anastomosing; forty round middle of body, those of the sides slightly smaller than those of the back and belly: ten supralabial plates, the fifth larger than the fourth or sixth, ninth very large: infralabials, eleven; chin plate transversely oblong, twice as wide as deep, width equalling three succeeding infralabials; three large lateral gular plates on each side, with one azygous gular behind the chin plate in front. *Colour:* Above light brown, with four or five, broad, transverse, blackish-brown bands, nine or ten scales wide (in some specimens these transverse bands are broken up irregularly by some lighter scales), with narrower, lighter intervals between, five or six scales wide, and three or four dark bands on tail, separated by slightly wider light spaces; top of the head dark brown, with a broad, brownish-black, ovate patch, extending from eye to upper part of ear; limbs and under-side of throat, belly and tail brownish-white, the distal part of limbs darker above; rough warty plates of soles of the feet and transverse subdigital plates brownish-black; iris dark brown; tongue bright Prussian blue; interior of mouth pink.

MEASUREMENTS.

	Ft.	Ins.	lines.
Total length of average specimen	1	4	6
Length of head from snout to anterior edge of ear	0	2	0
Width of head	0	1	9
Length of internasal plate	0	0	4½
Width of „ „	0	0	5
Length of frontal plate	0	0	6
Greatest width of frontal plate	0	0	5
Length of interparietal	0	0	5
Greatest width of interparietal	0	0	2
Length of middle pair of first row of occipitals	0	0	4
Length of second „ „ „	0	0	3
Length of third „ „ „	0	0	2½
Height of rostral plate	0	0	2½
Diameter of ear	0	0	4
From tip of snout to anterior edge of shoulder	0	3	4
Length of anterior limb to tip of longest claw	0	2	1
„ of longest toe and claw	0	0	4
„ from anterior edge of shoulder to anterior edge of thigh	0	6	10
„ of hind limb to extremity of longest claw	0	2	2
„ of tail	0	5	4
Girth round middle of body	0	5	9

Six transverse and seven longitudinal rows of scales in space of one inch on middle of back.

REFERENCE.—Peters, Monatsberichte, Berlin Akad., 1863, p. 231 = *C. fasciatus*, Lütken Vidensk. Meddel, 1862, p. 292, t. 1, f. 1.

This species is readily distinguished from the other two of the genus (figured in our plates 73 and 131) by the great number and size of the rows of occipital plates behind the inter-parietal. The head is also more pointed, and the colouring, which more nearly resembles that of *C. gigas* than *C. nigroluteus*, is distinguished by the smaller number and greater width of the transverse bands

marking the upper surface. This species is very rare in Victoria, only one or two specimens having been seen in the Western District, near Horsham ; it is, however, more common in South and West Australia. The specimen figured was presented to the Museum by Mr. Le Souef, who had it alive in the Zoological Gardens in the Royal Park.

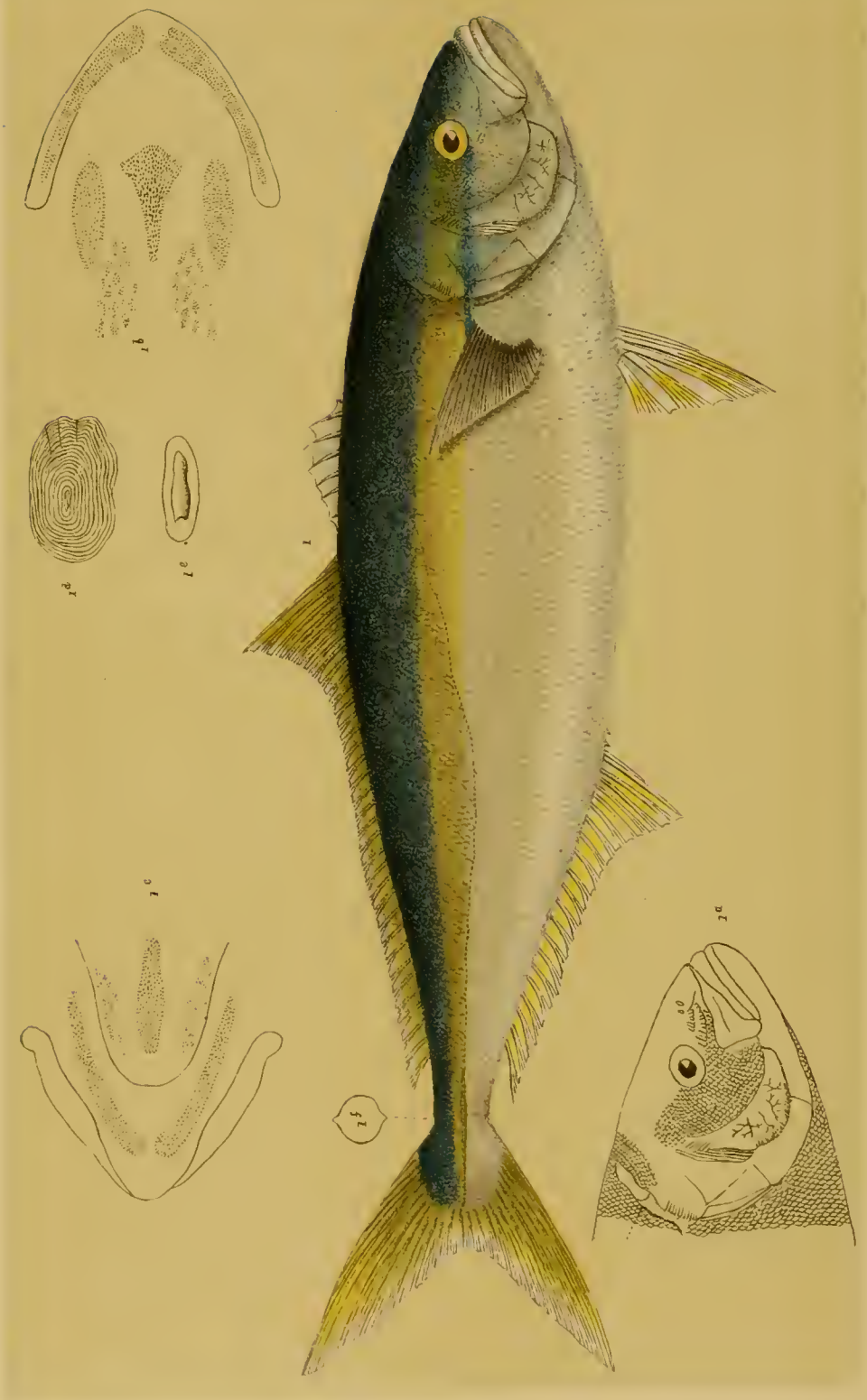
Explanation of Figures.

Plate 171.—Fig. 1, average specimen, two-thirds the natural size. Fig. 1*a*, top view of head, showing three rows of pairs of large occipital plates behind interparietal, natural size. Fig. 1*b*, under view of head, showing chin and infralabial plates, with large median and lateral gular plates below them. Fig. 1*c*, side view of head, showing labial plates and temporal plates of specimen with four lobed scales in front of ear. Fig. 1*d*, eye, showing surrounding scaly plates and five superciliary plates, magnified. Fig. 1*e*, front view, showing rostral and chin plates. Fig. 1*f*, magnified view of infralabial and gular plates. Fig. 1*g*, nasal plate pierced by nostril, with curved sulcus behind, magnified. Fig. 1*h*, scales of belly, magnified. Fig. 1*i*, scales of back, magnified. Fig. 1*k*, hind foot, showing tuberculated sole and transverse infradigital plates, magnified. Fig. 1*l*, same view of anterior foot, magnified.

Frederick McCoy.

ZOOLOGY OF VICTORIA

(Fishes)



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Prof. M.c Coy auct.

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PLATE 172.

SERIOLA LALANDI (CUV. AND VAL.).

THE YELLOW-TAIL.

[Genus SERIOLA (CUV.) (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostei. Order Acanthopterygii. Family Carangidæ.)

Gen. Char.—Body oblong, elongate, ovate, moderately compressed; profile of head moderately convex, slightly convex thence to origin of second dorsal, nearly straight thence to depression near base of caudal; profile of belly gently convex to origin of anal, nearly straight thence to a slight depression near origin of caudal; abdomen rounded, not sharp-edged. Scales very small, irregularly arranged. Cleft of the mouth moderate. First dorsal with small spines connected by membrane, nearly joining the very long falcate second dorsal; anal falcate, with two small spines, separate from the others in front; no finlets behind dorsal nor anal; caudal large, forked; pectoral and thoracic ventrals moderate. Lateral line undulated in anterior half, straight on posterior half, not armed by peculiar scales. Preoperculum very finely serrated by minute radiating striæ. Teeth forming broad, villiform bands on the jaws, the vomer and the palatine bones. Branchiostegal rays seven. Air-bladder large. Pyloric appendages many. Tropical and temperate seas.]

D. 7·1/34; A. 2·1/21; C. $\frac{4+12}{5+13}$; P. 20; V. 1. 5; L. lat. $203\frac{2}{4}\frac{8}{5}$.

DESCRIPTION.—Body elongate, ovate, greatest depth at origin of second dorsal, about equal to from snout to middle of base of pectoral; about $4\frac{1}{3}$ times in total length to end of caudal fin; snout about twice the diameter of the eye in length; maxillary very broad, as wide as diameter of eye behind, with supplementary bone above, reaching a little beyond anterior margin of orbit; ventrals $2\frac{1}{2}$ in distance between their origin and origin of anal. *Teeth:* A broad band of minute villiform teeth on each jaw; a broad, ovate patch on each palatine, behind which are larger groups of small clusters of minute teeth; vomer with a large patch, broad and rhombic in front, with a narrow posterior prolongation; a large rhomboidal patch on tongue, with numerous small clusters on sides. *Scales:* Very small, rounded, irregularly arranged; with an imperfect fan of few rays behind, and the concentric lines of growth slightly undulated, but not enough to serrate the posterior edge; those on cheeks about the same size as those on body; those of tubular lateral line narrow, elongate, oblong. The posterior and inferior edges of the preoperculum marked with very fine, radiating striæ, about 14 in three lines, giving a very minute, almost imperceptible serration to the edge (too coarse in our plate). Lateral line slightly and irregularly undulated to vertical of origin of anal, thence straight to middle of tail, raised into a distinct keel on the middle of pedicle. *Fins:* Spines of anterior dorsal thick but short, first spine one-third the length of the second; second dorsal falcate, the first ray simple, less than half the length of the second, all the rest largely branched; the second, third and fourth longest, rapidly diminishing to the fourteenth, after which they are nearly equal to the last two, which are larger than the preceding ones. Anal: The two short anterior spines, without membrane, are about the length of the second one, distant from the rest of the anal fin; first spine of continuous anal about one-third the length of the succeeding branched ray, which is longest; the length rapidly diminishing to the eighth, after which the length is nearly uniform to the last two, which are longer. Caudal large, deeply forked, the middle nearly straight. Pectoral and ventral fins moderately pointed.

MEASUREMENTS.

	Ft.	ins.	lines.
Total length from tip of snout to end of upper lobe of caudal, of small specimen	2	6	0
„ „ „ anterior edge of orbit	0	2	6
„ „ „ posterior edge of orbit	0	3	5
„ „ „ end of maxillary	0	2	8
„ „ „ edge of operculum	0	6	3
„ „ „ base of pectoral	0	6	10
„ „ „ first dorsal spine	0	8	9
„ „ „ first branched ray of dorsal	1	0	6
„ „ „ base of last ray of dorsal	1	11	3
„ „ „ base of ventral	0	7	6
„ „ „ first spine of anal	1	4	0
„ „ „ last ray of anal	1	11	0
„ „ „ origin of candal	2	2	6
Greatest length of pectoral	0	3	0
„ „ ventral	0	3	4
Height of first dorsal spine	0	0	3
„ second dorsal spine	0	0	9
„ first branched ray	0	3	0
„ twelfth branched ray	0	0	10
„ first anal spine	0	0	1
„ second anal spine	0	0	2
„ third anal spine	0	0	10
„ first branched ray	0	2	4
„ eighth branched ray	0	0	10
Length of lobes of caudal	0	4	7
Depth of head	0	5	0
Greatest depth of body, opposite origin of branched dorsal	0	6	9
Space between eyes	0	2	2
Diameter of orbit	0	0	11

Seven or eight scales in six lines about middle of body.

Colour: Caudal fin bright gamboge yellow, with darker base and narrow whitish posterior edge. Dorsal fin yellowish-olive, with brighter yellowish edge. Ventral and anal with pale purplish membrane, yellow rays and narrow whitish tips. Pectoral very pale yellowish, purplish at the base. A dull yellowish bronze band, about the width of the eye, extends from posterior edge of eye to upper half of base of tail, a little wider about middle of body, where its lower edge is slightly above the middle of the depth; back and sides, above yellowish band, dark purplish blue, darkest and with an olive tint on top of head, gradually becoming lighter over cheeks to throat; lips dull yellowish; sides, below yellowish band, and the belly pale purplish pearly white. Iris yellow.

REFERENCE.—Cuv. and Val., Hist. Nat. des Poiss., v. 9, p. 208 = *S. aureo-vittata*, Schlegel, F. Jap. Poiss., t. 62, f. 1 = *S. grandis*, Cast., Proc. Zool. Soc. Vict., v. 1, p. 115.

There can be no doubt that this fish, so very conspicuous by its size and colouring in the fish shops in summer, is perfectly identical with Schlegel's Japan *Seriola aureo-vittata*, and I should have preferred to use this name if Dr. Günther had not satisfied himself that it was a synonym of Cuvier and Valencienne's Brazilian *S. Lalandi*, which he traced by specimens across the Atlantic at St. Helena and the Cape of Good Hope. It is certain also that Count Castlenau's *S. grandis* of the Melbourne fish shops is the

same species, the difference he gives in number of the rays of the dorsal and anal fins being simply inexplicable. The numbers of the fin rays and spines, as I give them, have been tested on great numbers of specimens. The bright yellow of the tail, as in our figure, is generally very conspicuous, and as I give it ; but in many specimens the base is of a darker brownish hue, and sometimes, although rarely, the fin assumes a brownish olive tint. The bright gamboge yellow is, however, the striking, usual, characteristic colour. The yellow band passing through the eye along the sides to the tail, although generally very conspicuous, is occasionally duller or more obscure in some specimens. About three feet long is the average size ; but specimens occasionally occur four feet in length, and I have heard of some weighing 90lbs. The air bladder is large, with two small lateral lobes in front.

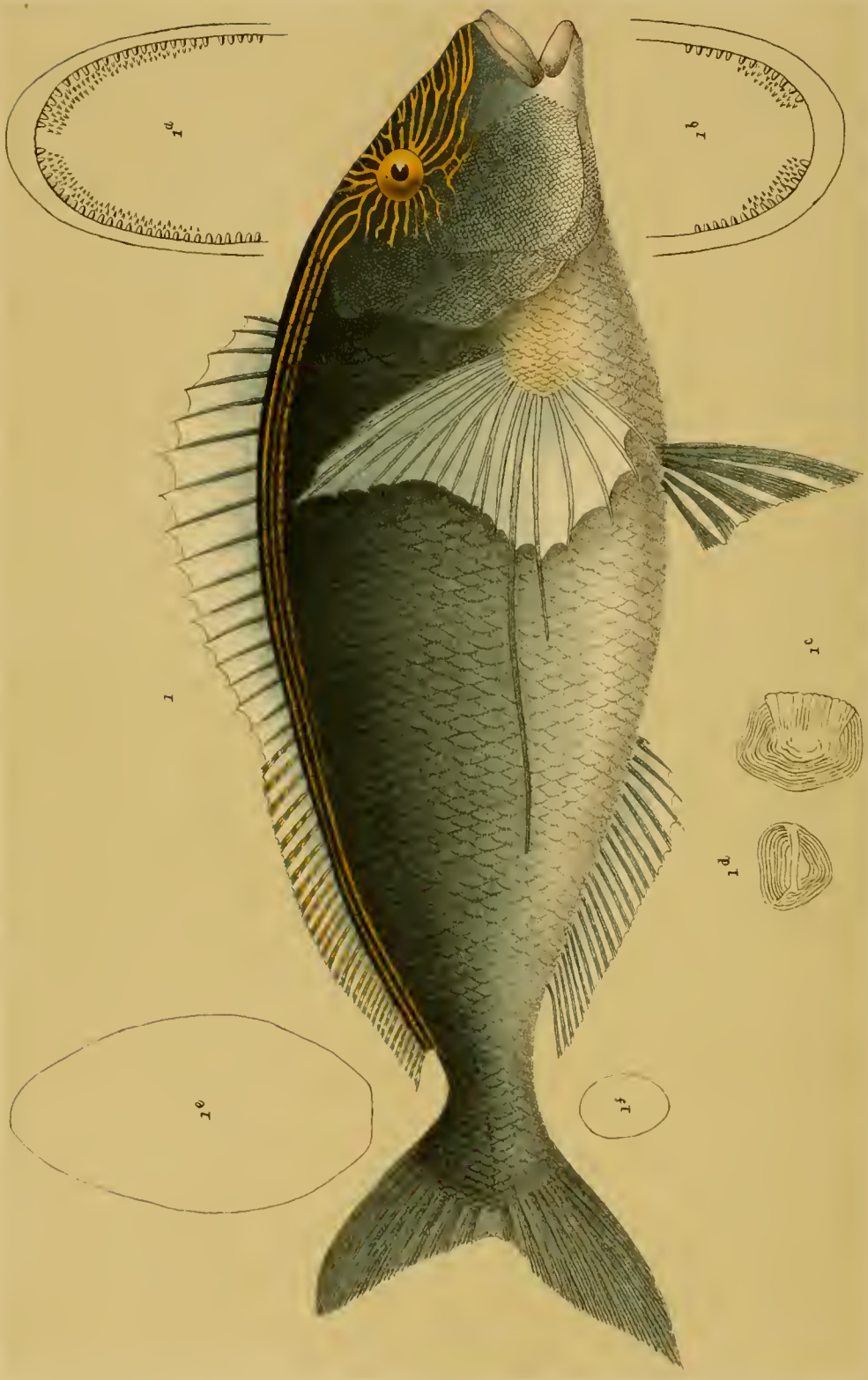
EXPLANATION OF FIGURES.

PLATE 172.—Fig. 1, average specimen, one-fourth the natural size. Fig. 1*a*, head (striation and serration of preoperculum much too coarse). Fig. 1*b*, teeth of jaws, vomer and palatine, three-fifths the natural size. Fig. 1*c*, teeth on upper jaw and tongue. Fig. 1*d*, scale of sides, magnified four diameters (the concentric lines and margin on the posterior portion should be slightly more undulated). Fig. 1*e*, scale from lateral line, magnified four diameters. Fig. 1*f*, section of pedicle of tail, to show the keels.

FREDERICK MCCOY.

ZOOLOGY OF VICTORIA

(Fishes)



A. Bartholomew del et lith.

Prof. M.c Coy. Surv.r

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Prof. M.c Coy. curat.

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PLATES 173 AND 174.

CHILODACTYLUS CARPONEMUS (CUV. AND VAL.).

THE LONG-FINGERED CHILODACTYLUS.

[Genus CHILODACTYLUS (Cuv.). (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygii. Family Cirrhitidæ).

Gen. Char.—Oval, compressed; mouth small. One dorsal fin, with 16 to 10 spines; anal fin of moderate length; ventrals under about the middle of pectorals; caudal forked; lower rays of pectoral unbranched, one or more prolonged beyond the membrane. Teeth in villiform bands on the jaws, outer row largest, but no canines; no teeth on the vomer or palatine bones. Preorbital and preoperculum entire. Scales of moderate size, cycloid. Cheeks and opercular pieces scaly. Five or six branchiostegal rays. Air-bladder usually with many lobes. Temperate regions of Pacific and Indian Oceans.]

B. 6*; D. 17 + 32†; C. 17; A. 3 + 19; V. 1 + 5; P. 15; L. l. 66$\frac{10}{19}$.

DESCRIPTION.—Ovate, dorsal and ventral lines moderately convex, tapering rapidly to near base of tail; seven lower rays of pectoral simple, also the upper two; sixth pectoral ray from bottom longest, reaching horizontally to posterior edge of row of scales running to eleventh ray of anal; fifth ray from bottom also elongate, but not reaching beyond the row of scales which forms anterior side of anus. Length of head $4\frac{1}{2}$ in total length including lower lobe of caudal; greatest depth $3\frac{1}{3}$ in same total length. Diameter of eye half the length of snout, $4\frac{1}{2}$ in length of head. Outer row of teeth strong and blunt, inner rows more slender and arched. Fifth and sixth dorsal rays longest; first dorsal moderately arched, outline only slightly rising to second dorsal, the rays of which are more nearly equal. First ray of anal half the length of second or third; all of them rather slender, second thickest. Scales on plates of head small, about three rows of very small scales on edges of channel into which the dorsal fins may be depressed. *Colour:* Bluish slate grey, fading to white on lower edge of jaw and belly, and brighter blue on top of head and snout. Numerous narrow, flexuous, bright yellow lines radiate from the upper three-fourths of the orbit, branching as they pass over the front; three of the branches running as narrow yellow lines below the base of dorsal. All the fin rays of the slate colour of the body, those of the pectoral palest, nearly white, and the branched rays of the dorsal with three rows of yellow spots; membrane greyish, almost colourless, except the caudal, which is nearly as dark as the body. Iris orange-yellow; lips pink. *Measurements:* Length from tip of snout to base of caudal, 2 ft. 4 ins. Proportional measurements to length of body, as 100: Tip of snout to edge of operculum, $\frac{25}{100}$; to anterior edge of orbit, $\frac{12}{100}$; diameter of orbit, $\frac{11}{100}$; longest (third) branched ray of pectoral, $\frac{21}{100}$; longest simple ray of pectoral, $\frac{40}{100}$; next below, $\frac{23}{100}$; next below, $\frac{15}{100}$; greatest length of ventral, $\frac{14}{100}$; greatest height of spinous dorsal, $\frac{7}{100}$; greatest height of branched dorsal, $\frac{4}{100}$; length of upper lobe of caudal, $\frac{17}{100}$; lower lobe of caudal, $\frac{20}{100}$; depth of body, $\frac{38}{100}$. (I think the shortness of the upper lobe of the tail in this specimen, the figured one, must be an accidental individual peculiarity).

REFERENCE.—Hist. Poiss., v. 5, p. 362, t. 128.

* Five long and a short anterior one. † Last two with one base.

This large and beautiful food-fish has not been figured of the colours of life before, and I find the markings variable in different individuals ; they disappear in spirit and stuffed specimens completely.

Rare in Hobson's Bay or at the Heads ; the specimen figured was caught in July, 1874.

EXPLANATION OF FIGURES.

PLATE 173.—Fig. 1, specimen, with lineated back, and with probably injured upper lobe of tail, about one-third of natural size. Fig. 1*a*, teeth of upper jaw, natural size. Fig. 1*b*, teeth of lower jaw, natural size. Fig. 1*c*, scale from middle of body, twice the natural size. Fig. 1*d*, scale from lateral line, twice the natural size. Fig. 1*e*, form of section of middle of body. Fig. 1*f*, section of pedicle of tail.

PLATE 174.

CHILODACTYLUS CARPONEMUS (CUV. AND VAL.) VAR.

D. 17 + 32; P. 15; V. 1 + 5; A. 3 + 18; C. $\frac{19}{9}$; L. l. 62$\frac{8}{18}$ (5 large, 3 small).

DESCRIPTION.—Sixth pectoral ray from bottom reaching horizontally to posterior edge of row of scales running to eighth ray of anal. First anal spine about half the length of the second, which is considerably thicker; third spine about as long as the second. *Colour:* Cheeks and sides of upper half of back pale purplish-grey, with yellowish-brown bronze reflections, and with the edges of the scales bright blue, fading to white on lower half of body and belly. Front of head from snout to dorsal fin bright ultramarine blue and rich opaline purple, with numerous greenish-yellow undulating bands radiating in pairs from upper three-fourths of eye, widening as they cross over the front; hinder ones only reaching edge of preoperculum (in another specimen they reach to edge of operculum), interrupted between the eyes. Middle of cheeks greenish; throat purplish; lower portion of opercular pieces and chin whitish; fin rays blue, those of the branched dorsal with two rows of yellow spots. Membrane of spinous dorsal, pectoral, and ventral, pale-purplish, nearly colourless. Membrane of branched dorsal, and anal, pale-greenish, obscurely clouded with blue, orange, and yellow; rays blue; a bright blue band at base on both rays and membrane; a pair of broad yellow lines (united posteriorly) run along base of branched dorsal. Membrane of caudal yellowish-olive, the upper and lower rays bright blue, a duller blue on middle rays and narrow posterior edge. Iris yellow. Lips pink; inside of mouth black. *Measurements:* Length from tip of snout to base of caudal, 2 ft. 2½ ins. Proportional measurements to length of body, as 100: Tip of snout to edge of operculum, $\frac{26}{100}$; to anterior edge of orbit, $\frac{13}{100}$; diameter of orbit, $\frac{5}{100}$; longest (third) branched ray of pectoral, $\frac{20}{100}$; longest simple ray of pectoral, $\frac{11}{100}$; next ditto, $\frac{20}{100}$; next below, $\frac{16}{100}$; greatest length of ventral, $\frac{15}{100}$; greatest height of spinous dorsal, $\frac{8}{100}$; greatest height of branched dorsal, $\frac{5}{100}$; length of upper lobe of caudal, $\frac{21}{100}$; lower lobe of caudal, $\frac{20}{100}$; depth of body, $\frac{37}{100}$.

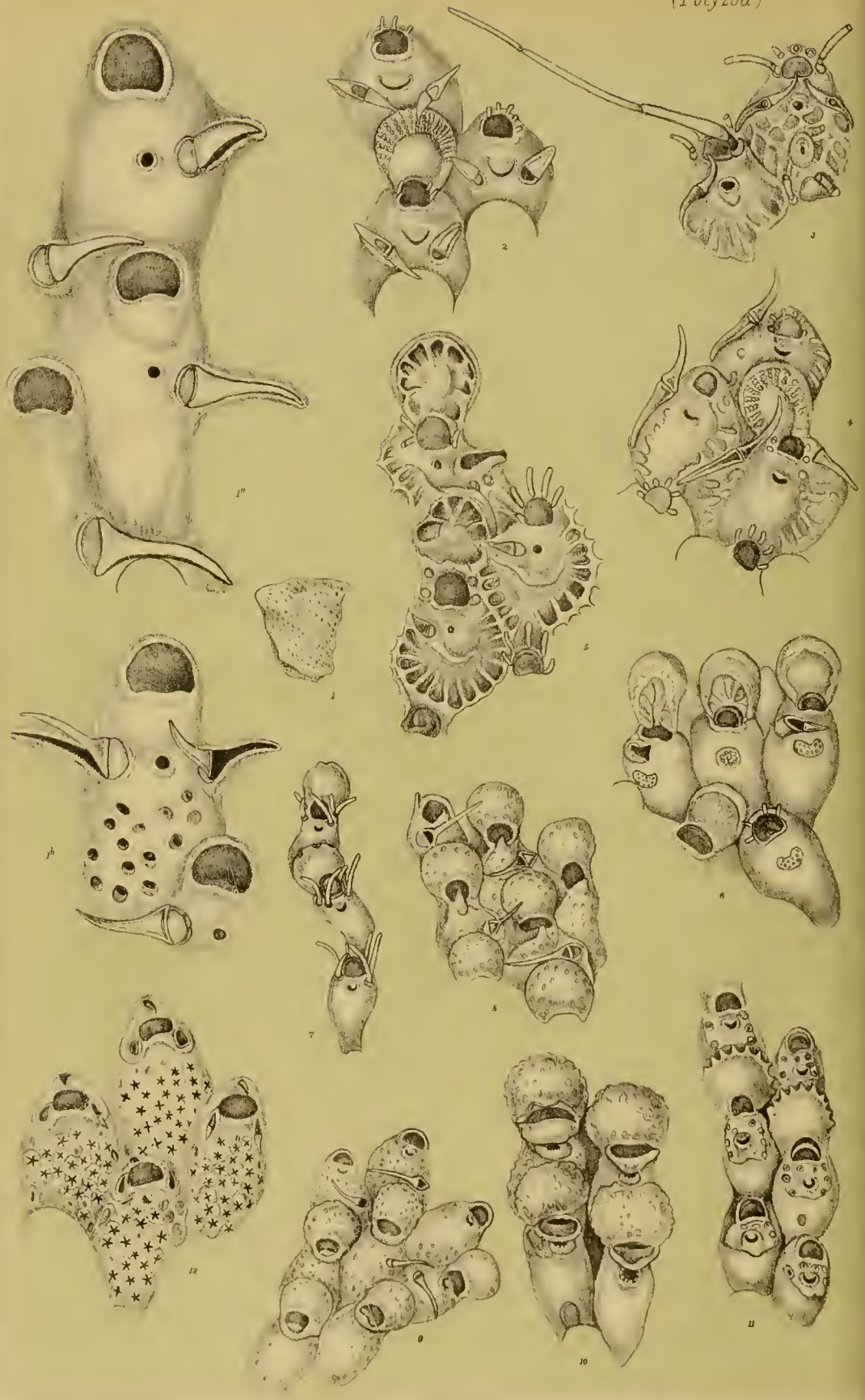
I believe the fish figured on this plate to be only a variety of that represented on Plate 173. The specimen figured was caught at Port Phillip Heads in December, 1884.

EXPLANATION OF FIGURES.

PLATE 174.—Fig. 1, specimen, with plain back, and form of perfect caudal, about one-third the natural size. Fig. 1*a*, top of head to show pattern of the lineations. Fig. 1*b*, teeth of upper and lower jaws. Fig. 1*c*, scale from below lateral line, magnified two diameters. Fig. 1*d*, tubular scale from lateral line, magnified two diameters. Fig. 1*e*, scale from above lateral line, magnified two diameters.

FREDERICK MCCOY.

Tessarinoma
Macropodella
Eschscholtzia



2·3·4·5
M
diadema

7 - M
scandens

9 M

Plate 175, Fig. 1.

TESSARADOMA MAGNIROSTRIS (McG.).

[Genus TESSARADOMA (Norman). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Microporellidæ.)
Gen. Char.—Zoarium encrusting, or foliaceous and unilaminate, or erect and ramose. Zoœcium with the peristome produced and turned forwards in a tubular or subtubular manner; a median, tubular, zoœcial pore.]

Description.—Zoarium hemescharine, large, thick. Zoœcia large, indistinct, smooth when the thick epitheca is entire, with large perforations when this is removed; zoœcial pore rounded, elevated, between the mouth and the middle of the zoœcium; mouth large, nearly straight below, arched above, peristome raised. On each side of the zoœcium, below the mouth, a large avicularium with the long, pointed mandible directed transversely outwards.

References.—*Lepralia magnirostris,* P. H. MacGillivray, Tr. Roy. Soc. Vict., July, 1882; *Porina magnirostris,* Hincks, Ann. and Mag. Nat. Hist., October, 1884.

Port Phillip Heads.

Forms a thick hemescharine zoarium, the layers being occasionally folded and united back to back. The zoœcia are large and very indistinct. The whole surface is covered by a thick epitheca on which the only mark seen is the tubular opening of the zoœcial pore. When the epitheca is removed, the surface is seen to be covered with large perforations. In old specimens these may be filled in, or even become tubercular from the heaping up of calcareous matter. I have not seen oœcia.

I have elsewhere shown that the name *Porina,* originally proposed by D'Orbigny (Paléontologie Française, v. 432) to include, amongst living forms, *P. Africana* (D'Orb.) and *Eschara gracilis* (Milne-Edwards), ought to be retained for those agreeing with Milne-Edwards' species in the possession of an external or adventitious pore formed by the growth of the peristome and, therefore, opening externally to the true mouth. *Tessaradoma,* proposed by Norman for another species previously described by Busk as *Onchopora borealis* and by Sars as *Quadricellaria,* clearly

belongs to those species agreeing with his type and the present in having, among other characters, a true zoœcial pore.

EXPLANATION OF FIGURES.

PLATE 175.—Fig. 1, specimen, natural size. Fig. 1*a*, two zoœcia covered by the epitheca. Fig. 1*b*, zoœcium denuded of the epitheca.

PLATE 175, FIGS. 2, 3, 4, 5.

MICROPORELLA DIADEMA (McG.).

VARIETIES LUNIPUNCTA, LONGISPINA, LATA, AND CANALICULATA.

[Genus MICROPORELLA (HINCKS). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Microporellidæ.)
Gen. Char.—Mouth arched above, straight below, peristome not raised; a single zoœcial pore or a perforated plate below the mouth. Oœcia external.]

The ordinary form of this common and beautiful species has been already figured in Plate 37, fig. 6, and described. It is subject to considerable variation, principally in the markings of the surface, the size and form of the zoœcial pore, as well as the spines and oœcium. *Lepralia lunata* (Plate 36, fig. 8) is also referable to the same species. Mr. Waters considers *M. diadema* as a form of the fossil *Eschara decorata* of Reuss, a determination with which I cannot agree.

The following varieties are worthy of distinction:—

Variety *lunipuncta* (McG.). Zoœcia broad, smooth and slightly grooved at the edge. Zoœcial pore a narrow lunate slit, equalling the mouth in width. Avicularia large, below the pore, with the mandible pointed upwards and outwards. Tr. Roy. Soc. Vict., Nov. 1884.

Variety *longispina* (McG.). Zoœcia broad, slightly calcareous, grooved at the edges; oral spines large, long, the lower on one or both sides of enormous length, antenniform, and articulated outside the peristome. Zoœcial pore round, oval or semicircular, of moderate or rather small size. Avicularia opposite the pore, pointing downwards and outwards. Tr. Roy. Soc. Vict., Nov. 1884.

Variety *lata* (McG.). Zoœcia broad, flat, smooth except faint grooving at the edges. Zoœcial pore of moderate size, semilunar. Avicularia generally situated above the level of the pore, sometimes by the side of the mouth, the long slender mandible mostly directed downwards. Tr. Roy. Soc. Vict., Nov. 1884.

Variety *canaliculata* (McG.). Zoœcia very calcareous, edges deeply grooved, the intervening divisions and margins very calcareous; the grooves converging towards the central part, which is marked off by a heaped-up calcareous ridge. Zoœcial pore of moderate size, circular. Avicularia large, usually on one side only of the pore, with the mandible directed outwards. In the oœcia the band is smooth and a series of deep grooves, separated by calcareous ridges, converge to the centre, which is raised. In young specimens, the deposition of calcareous matter is very much smaller and the markings proportionately less distinct, but the form as figured is very soon assumed. It is that which I previously described as *Lepralia canaliculata* (Plate 37, fig. 4), but an examination of numerous specimens has satisfied me that, however distinct in appearance at first sight, it ought properly to be ranked merely as a variety of *M. diadema*. Tr. Roy. Soc. Vict., Nov. 1884.

EXPLANATION OF FIGURES.

PLATE 175.—Fig. 2, *Microporella diadema*, variety *lunipuncta*. Fig. 3, variety *longispina*. Fig. 4, variety *lata*. Fig. 5, variety *canaliculata*.

PLATE 175, FIG. 6.

MICROPORELLA RENIPUNCTA (McG.).

DESCRIPTION.—Zoœcia ovate, distinct, smooth or faintly areolated at the margins; mouth straight below, arched above, with three or four spines; a large, reniform, punctate plate, covering a zoœcial pore below the mouth. An avicularium, with sharp pointed mandible, situated transversely between the pore and the mouth. Oœcia large, prominent, traversed by a thickened ridge separating an inferior area which is smooth or marked with radiating lines.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., July, 1882.

Port Phillip Heads.

Readily distinguished by the reniform, usually bulging plate covering the zoœcial pore, the transverse avicularium (occasionally wanting), and the structure of the zoœcium. In a variety of *M. ciliata* from California the round zoœcial pore is closed by a finely cribriform plate.

EXPLANATION OF FIGURE.

PLATE 175.—Fig 6, portion of specimen, magnified.

PLATE 175, FIG. 7.

MICROPORELLA SCANDENS (McG.).

DESCRIPTION.—Zoœcia pyriform, smooth; mouth straight below, arched above; four or six long, articulated oral spines; zoœcial pore small and lunate. Oœcia large, rounded, upper edge, where adpressed to the zoœcium above, slightly dentate.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov. 1884.

Port Phillip Heads.

I have only seen a single small specimen, consisting of a chain of eight zoœcia, four surmounted by oœcia, running up a twig of *Bicellaria grandis*. The habit of growth is not likely to be constant, but it seems to be a distinct species from any other described form.

EXPLANATION OF FIGURE.

PLATE 175.—Fig. 7, portion of specimen, magnified.

PLATE 175, FIGS. 8 AND 9.

MICROPORELLA CILIATA (LINN. SP.).

VARIETIES SPICATA AND PERSONATA.

The cosmopolitan *Microporella ciliata*, already figured in Plate 37, fig. 1, is a very variable species, but can always be distinguished by the form of the mouth, the suboral pore, and lateral avicularia. These last vary much. In Australian specimens

they have usually the rostrum very small, and a very long, vibraculoid, setiform mandible, but in others the avicularium is large, the mandible being broad, short and triangular.

The following varieties are figured :—

Variety *spicata* (McG.). Zoœcia finely granular, a stout conical process from the front of the zoœcium, below the pore which it conceals, directed upwards; avicularium with long vibraculoid mandible. Oœcia prominent, granular. This resembles a figure given by Hincks as var. *Californica*, but Busk (Q. J. Mic. Sc., iv. 310) does not describe the peculiar process in his *L. californica* which undoubtedly is also a variety of M. *ciliata*.

Variety *personata* (Busk). An extension of the sides of the oœcium across the lower lip of the fertile zoœcia. The zoœcial pore seems to be sometimes external to this hood or pouch and sometimes enclosed within it. Avicularian mandible long and vibraculoid. It has been described by Busk (Brit. Mus. Cat., Mar. Pol., pt. ii., p. 74, pl. xc., figs. 2, 3, 4; and *Challenger* Pol., pt. i., p. 137) as a distinct species, in consequence of the peculiar growth of the oœcium, a structure which occurs in several other species, not only of this genus. Hincks has rightly (Brit. Mar. Pol.) described it as a variety.

Explanation of Figures.

Plate 175.—Fig. 8, *Microporella ciliata*, variety *spicata*. Fig. 9, variety *personata*.

Plate 175, Figs. 10 and 11.

MICROPORELLA MALUSII (Audouin sp.).

VARIETIES PERSONATA AND THYREOPHORA.

This species has been already figured (Pl. 36, fig. 7) and described, but the following varieties require notice :—

Variety *personata* (McG.). Zoœcia elongated, smooth, with very few stellate puncta; zoœcial pore large, transverse. Oœcia

large, granular, with a hooded extension across lower lip of fertile zoœcium, the lower part frequently obscuring the pore which is external to it.

Variety *thyreophora* (Busk). Zoœcium with a scutiform area of variable size marked off in front, usually a row of stellate puncta on each side of this area and a transverse row immediately below the lower lip; occasionally a double row on each side of the area; the lower part of the zoœcium without puncta. Oœcia usually large and entire, but at other times of moderate size and dentate, as in the figure. It is described as a distinct species by Busk (Quart. Journ. Mic. Science, v. 172, pl. xv., figs. 4, 5) and as a variety by Hincks (Brit. Mar. Pol., p. 212).

Explanation of Figures.

Plate 175.—Fig. 10, *Microporella Malusii*, variety *personata*. Fig. 11, variety *thyreophora*.

Plate 175, Fig. 12.

ESCHARIPORA STELLATA (Smitt).

[Genus ESCHARIPORA (Smitt). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Microporellidæ.)

Gen. Char.—Zoarium encrusting. Mouth arched above, straight below; several stellate zoœcial pores on the front of the zoœcia. Avicularian mandibles without projecting articular processes.]

Description.—Zoarium encrusting. Zoœcia distinct, broadly oval; surface with numerous stellate zoœcial pores; mouth nearly straight below, thickened and arched above. A sessile avicularium at each angle of the mouth, the mandible directed upwards and inwards; usually a third avicularium above the mouth with the mandible directed downwards.

References.—*Escharipora stellata*, Smitt, Floridan Bryozoa, pt. ii., p. 26., pl. vi., fig. 130–133; *Microporella stellata*, P. H. MacGillivray, Tr. Roy. Soc. Vict., July, 1882.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

Forms very pretty silvery zoaria. The pores in young specimens pierce the centres of thin rounded eminences. As age advances the pores become depressed owing to the deposition of calcareous matter between them. The supra-oral avicularium is not always present. I have not seen oœcia.

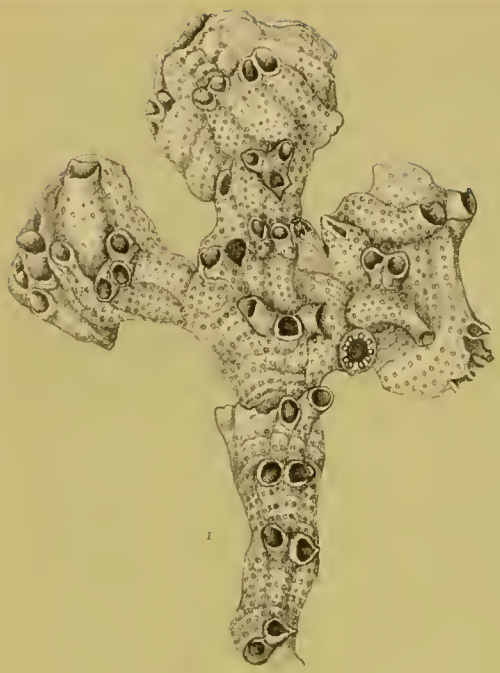
Smitt first proposed the genus *Escharipora* for species of *Cribrilina* (Gray) which he again referred back to that genus in the Floridan Bryozoa. He there retains *Escharipora* for the present and another species, *E. mucronata*, which he doubtfully places with it, referring also to the same genus *Eschara lichenoides* (Busk, not M. Edwards) and *E. distoma*. At present, at any rate, I think it is better to keep this species under *Escharipora*, of which it may be taken as the type. It forms the transition between *Microporella* and *Adeona* and *Adeonellopsis* (McG.). The avicularian mandibles have no projecting articular processes as are found in *Adeonellopsis*, but not, so far as I am aware, in the true *Microporellæ*. These processes are not, however, as Busk supposed, confined to the *Adeona* group. I cannot agree with those authors who would unite *Adeona* and *Adeonellopsis* with *Microporella* for the sole reason of the presence of zoœcial pores, as, besides the multiple or simple presence of these pores, there are other important differences which will be discussed when describing *Adeonellopsis*.

Explanation of Figure.

Plate 175.—Fig. 12, Group of zoœcia before calcification has so far advanced as to cause depression of the zoœcia.

The specimens and descriptions of the species figured in this plate have been contributed by Mr. MacGillivray.

Frederick McCoy.



F. H. Macgillivray del.
J. Rippon lith.

Prof. McCoy direxit.

Steam litho. Gov. Printing Office.

PLATE 176, FIG. 1.

STOMATOPORA GEMINATA (McG.).

[Genus STOMATOPORA (BRONN). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cyclostomata. Family Tubuliporidæ.)
Gen. Char.—Zoarium adnate, simple or irregularly branched; branches linear or ligulate. Zoœcia in single series or in more or less regular transverse rows.]

DESCRIPTION.—Zoarium branched; branches obscurely concentrically rugose; surface with numerous small, brown, white-bordered puncta or pores. Zoœcia separated by shallow sulci, opening in pairs or triplets; mouths projecting, turned rectangularly forwards, and closely united together laterally throughout their length.

PT. REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., March 1886.

EXPLANATION OF FIGURE.

PLATE 176.—Fig. 1, specimen magnified.

PLATE 176, FIG. 2.

FLOSCULIPORA PYGMÆA (McG.).

[Genus FLOSCULIPORA (McG.). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cyclostomata. Family Discoporellidæ.)
Gen. Char.—Zoarium small, pedunculate, the peduncle consisting of smooth tubes or ridges, with intervening cancelli towards the upper part. Zoœcia opening on the expanded summit, the peristome produced, dimidiate or lacerated, with numerous intermediate cancelli.]

DESCRIPTION.—Peduncle composed of polished tubes, close together below, but separated above by intervening cancelli. Zoœcia in distinct series at the margin, but confused towards the centre; peristome of the external produced, dimidiate, bifid or lacerated, of the internal very little developed and frequently represented by a small spinous process. Cancelli between the rows of zoœcia, externally large, towards the centre small and much resembling the zoœcia.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., July 1886.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

This exquisite little species forms tufts about $\frac{1}{1\frac{1}{2}}$ of an inch high, and resembles a microscopic bouquet of flowers. It is attached to the zoœcia of Catenicella. The external zoœcia are very distinct, those on the outside continuous with the outer tubes of the stem. No doubt the whole peduncle is composed of the lower tubular parts of the zoœcia.

EXPLANATION OF FIGURES.

PLATE 176.—Fig. 2, specimen, natural size. Fig. 2*a*, the same, magnified.

PLATE 176, FIG. 3.

LICHENOPORA MAGNIFICA (McG.).

[Genus LICHENOPORA (DEFRANC). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cyclostomata. Family Discoporellidæ.)

Gen. Char.—Zoarium adnate or partially free, frequently discoid or cupped, usually growing on a basal lamina, with a thin external margin. Zoœcia partially free, disposed irregularly or in radiating series, with the intermediate surface cancellated, the cancelli, however, sometimes very obscure or almost wanting; peristome usually lacerated or pointed to one side.]

DESCRIPTION.—Zoarium encrusting, thick, raised into irregular mounds. Zoœcia frequently closed by a membrane a short way down, either entire or with a circular aperture in the centre; orifice very irregular in size, usually oval, with the peristome produced on one side into a thick, spout-like, nearly erect projection, or sometimes divided. The zoœcia in many parts arranged on slightly elevated ridges, radiating from a depressed central portion; in the lower and intervening zoœcia the peristome slightly developed, although often divided into two or three narrow processes; those on the ridges with the spout-like peristome entire or with small secondary processes on the sides, always pointing towards the central depression.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., July 1886.

Port Phillip Heads, Mr. J. B. Wilson.

The largest specimen I have seen spreads as an encrusting layer over a calcareous mass, composed of *Cellepores* and other polyzoa, and covers an extent of upwards of six inches. The whole is covered with large, irregular elevations, which are again nodulated. These large elevations are in part caused by the elevation of the calcareous zoophytal mass on which it grows, but several of the nodules, having a diameter of a quarter of an inch or more, are entirely of this species, and in parts the continuous layer is of an equal thickness. As in other species, the zoarium extends by a basis or lamina, on which the cells are developed. The zoœcia are allied to those of *L. (Discoporella) pristis*, of which it may possibly prove to be a variety. The zoœcia between the rays and generally over the zoarium have the peristome not produced, or but slightly, and divided into two or three sharp processes. Those on the ridges have it produced on one side into a stout, spout-like process directed towards the centre of the elevation.

EXPLANATION OF FIGURES.

PLATE 176.—Fig. 3, portion, natural size, showing groups of radiating ridges. Fig. 3*a*, small portion, magnified, showing two ridges and the intervening depressed portion.

PLATE 176, FIG. 4.

LICHENOPORA BULLATA (McG.).

DESCRIPTION.—Zoarium encrusting, thick, irregular. Zoœcia irregular in shape and size, prismatic, with rounded angles; walls thick, with numerous internal, minute, sharp spines. The zoœcia at the edges of the oœcia with an elongated peristome on one side, spout-like or divided, directed towards the elevation. Oœcia scattered over the zoarium, large, bullate, minutely punctate or perforated, the zoœcia underneath closed by a minutely punctate membrane or plate.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., July 1886.

Port Phillip Heads, Mr. J. B. Wilson; Warrnambool, Mr. Watts; Portland, Mr. Maplestone.

In these two species the cancelli are very obscure or absent; there are smaller apertures of which it is difficult to say whether they are really cancelli or aborted zoœcia. This subject, as well as the relations and differences between the Tubuliporidæ and Discoporellidæ, will be recurred to when describing the other species.

The generic name *Lichenopora*, having priority over that of *Discoporella*, ought to be retained.

EXPLANATION OF FIGURES.

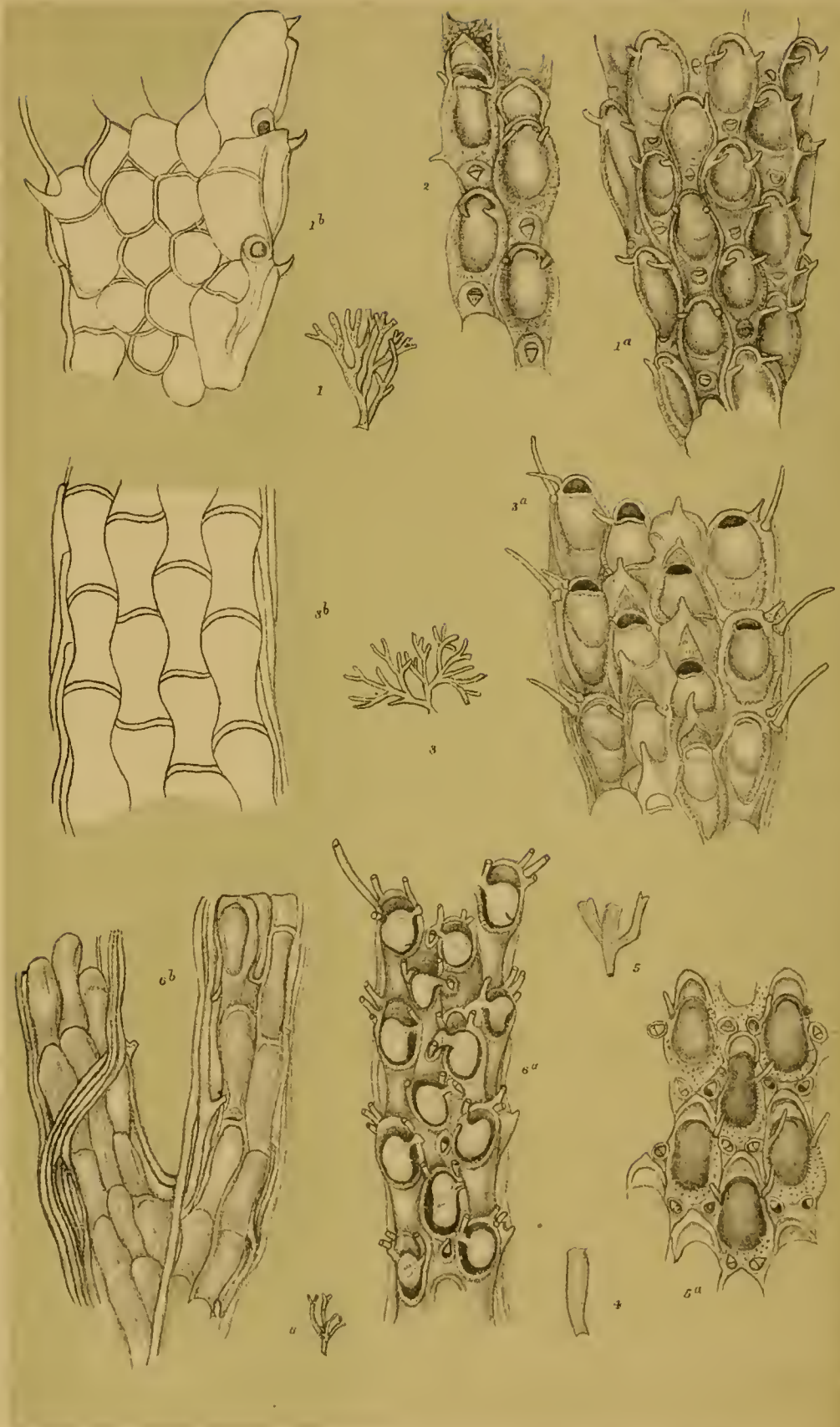
PLATE 176.—Fig. 4, specimen, natural size. Fig. 4*a*, portion magnified, showing an oœcium which has been opened to expose the orifices of the subjacent zoœcia. Fig. 4*b* and 4*c*, zoœcia from other parts of the same.

The specimens figured on this plate have been presented to the National Museum, and the descriptions to this work, by Mr. MacGillivray.

FREDERICK McCOY.

* 177

Craspedozoum
insigne



P.H. Macgillivray del
J. Ripper lith

Prof. McCoy direxit

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PLATE 177, FIGS. 1 AND 2.

CRASPEDOZOUM LIGULATUM (McG.).

[Genus CRASPEDOZOUM (McG.). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Flustridæ.)

Gen. Char.—Zoarium erect, in ligulate divisions, uni- or bi-laminate, each branch bordered throughout its whole extent by a bundle of radical fibres springing from the bases of the lateral zoœcia. Zoœcia quadrate, aperture partly filled in by a thickened lamina. Oœcia external.]

DESCRIPTION.—Zoarium unilaminate, erect, dichotomously divided into narrow ligulate lobes. Zoœcia ovate, aperture partly filled in by a finely granulated thickened lamina; a sharp spine on each side above. A single avicularium on an eminence at the base of the zoœcia. Posteriorly the outlines of the zoœcia irregularly rhomboidal. Oœcia mitriform, thickened at the upper margin, leaving a depressed area in front.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov. 1885.

Port Phillip Heads.

EXPLANATION OF FIGURES.

PLATE 177.—Fig. 1, specimen, natural size. Fig. 1*a*, anterior surface of portion of a branch of the same, magnified. Fig. 1*b*, posterior surface of the same. Fig. 2, small portion of another specimen showing the oœcia.

PLATE 177, FIG. 3.

CRASPEDOZOUM SPICATUM (McG.).

DESCRIPTION.—Zoarium unilaminate, erect, dichotomously divided into narrow ligulate lobes. Zoœcia ovate, margins granular and lower part of aperture filled in by a thickened granular lamina; an erect spine at each side superiorly, and in the marginal zoœcia an additional longer spine below the usual one at the outer angle. A sessile avicularium on an umbonate eminence frequently at one side of the base of the zoœcia, but often absent. Oœcia mitriform, produced upwards into a prominent apiculate spine; anterior area very small. Posteriorly the zoœcia elongated, straight above, constricted in the middle.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov. 1885.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

EXPLANATION OF FIGURES.

PLATE 177.—Fig. 3, specimen, natural size. Fig. 3*a*, portion of same, magnified, anterior view. Fig. 3*b*, posterior view.

PLATE 177, FIGS. 4 AND 5.

CRASPEDOZOUM ROBORATUM (HINCKS, SP.).

DESCRIPTION.—Zoarium bilaminate, divided into flat, broadly-ligulate lobes. Zoœcia quadrate; aperture occupying greater part of the front, the sides and base partly filled in by a sloping, thickened, granular lamina; a single erect spine on each side above. On each side at the base of the zoœcia, except the marginal, a sessile avicularium on a rounded elevation, with the mandible directed obliquely outwards; the marginal cells with only a single avicularium. Oœcia somewhat mitriform, the upper rim thickened, leaving a depressed area inferiorly.

REFERENCES.—*Membranipora roborata*, Hincks, Ann. and Mag. Nat. Hist., Aug. 1881; *Flustra membraniporides*, Busk, "*Challenger*" Polyzoa, pt. i, p. 54, pl. xxxii., fig. 7.

Port Phillip Heads.

These three forms constitute a well marked group, for which I have proposed the name *Craspedozoum*. It is allied to *Flustra* and *Membranipora*, or more properly to *Biflustra*, in the structure of the zoœcia, and to the first named in the lobulate and erect habit of growth.

C. roboratum and *C. ligulatum* are much allied, and farther observation may show that they ought to be ranked as varieties of one species. In *C. ligulatum* the lobes, besides being unilaminate are much narrower, the zoœcia are narrower, and there is usually only a single avicularium at the base of each, while in *C. roboratum* the lobes are broader, with about double the series of zoœcia, and there are two avicularia on the zoœcia, except in the marginal where there is only one. *C. spicatum* is quite distinct; the zoœcia are not so calcareous, there is a larger filling in of the aperture, there is a single, frequently lateral avicularium similar to that of *Canda*, a second larger spine at the outer angle of the marginal zoœcia, and the posterior aspect of the zoœcia is of an entirely different shape. The oœcia also differ markedly in being produced upwards into a sharp apiculate point or spike, and the anterior depressed area is very small.

EXPLANATION OF FIGURES.

PLATE 177.—Fig. 4, portion of specimen, natural size. Fig. 5, another specimen, natural size. Fig. 5*a*, portion of same, magnified.

PLATE 177, FIG. 6.

MENIPEA FUNICULATA (McG.).

[Genus MENIPEA (LAMX.). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Cellularidæ.)

Gen. Char.—Zoarium articulate or (in one species) continuous. Zoœcia bi-multiserial, oblong, imperforate behind. A sessile, lateral avicularium (frequently absent), and one or two sessile avicularia (also frequently absent) on the front of the zoœcia. No vibracula.]

DESCRIPTION.—Zoarium continuous, dichotomously branched; branches narrow, bordered by radical fibres springing from the lower part of the back of the cells. Zoœcia multiserial, elongated, aperture large, elliptical, with a slightly thickened margin, and overlapped by a large sacculated fornix; the marginal zoœcia with three spines at the outer angle and one at the inner; the central with a single spine at each side. A sessile avicularium (usually absent) attached to the upper and outer angle of the lateral zoœcia; a sessile avicularium on the front of each zoœcium, except the marginal, usually close to the peduncle of the fornix of the adjoining zoœcium. Zoœcia posteriorly quadrate, smooth or faintly longitudinally sulcate. Oœcia prominent, rounded, smooth.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov. 1885; *? M. benemunita*, Busk, *Challenger*, Pol., pt. i., p. 19, pl. iv., fig. 4.

Port Phillip Heads.

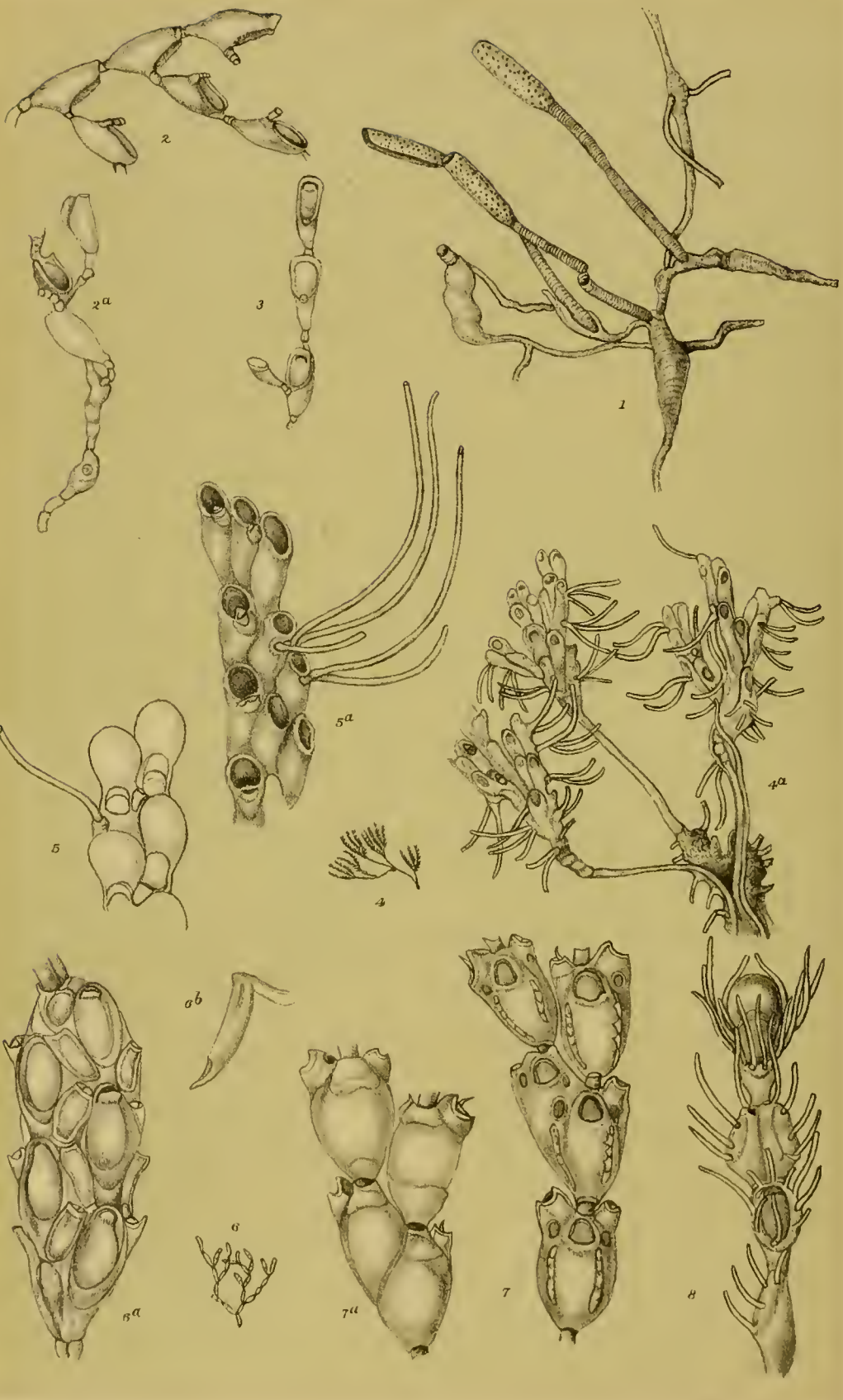
Differs from the other species of *Menipea* in the zoarium being continuous and in the margin of radical fibres.

EXPLANATION OF FIGURES.

PLATE 177.—Fig. 6, specimen, natural size. Fig. 6*a*, anterior view of portion of same. Fig. 6*b*, posterior view, showing attachment of radical fibres.

I am indebted for the specimens and descriptions of the Polyzoa on this plate to Mr. MacGillivray.

FREDERICK MCCOY.



P.H. Macgillivray del.
J. Rippin lith.

Prof. McCoy direxit.

Steam Litho. Govt. Printing Office.

PLATE 178, FIG. 1.

ÆTEA RECTA (HINCKS).

[Genus ÆTEA (LAMX.). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Æteidæ.)
Gen. Char.—Zoœcia arising from a creeping or partially free stolon which is dilated at intervals, tubular, with a subterminal membranous aperture. No avicularia or oœcia.]

DESCRIPTION.—Zoœcia rising from large inflations of a creeping stolon, erect, truncated, upper portion straight and not enlarged; aperture long, lateral; lower part of zoœcium finely ringed, the rings ceasing immediately above the commencement of the aperture, the upper part being finely punctate.

REFERENCE.—Hincks, Brit. Mar. Polyzoa, p. 6, pl. i., figs. 6 and 7.

Port Phillip Heads.

Readily distinguished from the other species by the erect, straight habit, the truncated extremity, the upper part being scarcely if at all dilated, and the length of the aperture, which is about a third of that of the whole zoœcium. I see no reason for considering this as a variety of *Æ. anguina*, as has been done by some writers.

EXPLANATION OF FIGURE.

PLATE 178.—Fig. 1, specimen, magnified, showing stolon and zoœcia.

PLATE 178, FIGS. 2 AND 3.

SCRUPARIA CHELATA (LINN. SP.).

[Genus SCRUPARIA (OKEN). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Eucrateidæ.)
Gen. Char.—Zoarium composed of tufts springing from a creeping, adherent base; branches originating from the front of a zoœcium, below the aperture. Each zoœcium arising from the preceding by an articulated tube at the upper and posterior part.]

DESCRIPTION.—Zoœcia glassy, horn-shaped, very narrow below and widened above, aperture very large, oblique, truncated above, with a distinct raised, smooth margin, usually an aborted zoœcium below the aperture.

REFERENCE.—*Scruparia chelata*, Busk, Brit. Mus. Cat., Mar. Pol., pt. i., p. 29, pl. xvii., fig. 2; *Eucratea chelata*, Hincks, Brit. Mar. Pol., p. 14, pl. i., fig. 3; pl. ii., figs. 4–8; pl. iii., figs. 9–12.

Port Phillip Heads, on algæ and zoophytes.

The branches of this elegant little species usually spring from dilatations of a slender creeping stolon very similar to that of *Ætea* ; at other times, instead of dilatations, there are decumbent zoœcia connected by a creeping annulated tube, a branch rising from below the aperture. They also sometimes arise directly from the primary cell which is short, circular, and with a rounded aperture occupying the whole of the contracted summit. The zoœcia are much elongated, attenuated below, each giving origin by its summit to another connected by a short annulated tube. The secondary branches are few and originate from the front of the zoœcia just below the aperture. When there are no branches there is usually an aborted stem of a zoœcium. I have not seen the oœcia, Mr. Hincks describes them as mitriform, somewhat pointed above, with a keel down the centre, borne below the aperture on an imperfectly developed cell.

EXPLANATION OF FIGURES.

PLATE 178.—Fig. 2, portion of a branch, magnified. Fig. 2*a*, portion of creeping stolon of same. Fig. 3, portion of another specimen, seen from above.

PLATE 178, FIGS. 4 AND 5.

RHABDOZOUM WILSONI (HINCKS).

[Genus RHABDOZOUM (HINCKS). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Chcilostomata. Family Rhabdozoidæ.)

Gen. Char.—Zoarium phytoid, erect, consisting of celliferous, cylindrical, bifid or trifid shoots, attached by numerous radical fibres springing from the sides ; straight hollow chitinous rods springing from the sides of the primary shoots and supporting on their summits other celliferous branches. Zoœcia pyriform, with a considerable oblique aperture, arranged in longitudinal series round an imaginary axis. Avicularia sessile.]

DESCRIPTION.—Zoarium consisting of branches supported on transparent, hollow chitinous rods, springing from the sides of celliferous shoots attached by bundles of radical fibres; each rod spirally twisted, slightly at its commencement and more strongly at its upper extremity where it is enlarged into a disc or sort of calyx, surmounted by a circle of long, spreading and incurved glassy spines; each calyx giving origin to a short branch which immediately divides into usually three. Zoœcia pyriform, slightly turned forwards above, each connected with the preceding immediately behind its upper extremity, arranged in parallel longitudinal series round the axis; immediately below the aperture a transverse row of two or three

long, glassy, hollow spines, articulated to bulbous processes, spreading outwards and curving upwards; in many zoœcia a sessile avicularium in the place of these spines, with the sharp beak and triangular mandible directed forwards. Oœcia rounded, terminal.

Reference.—Hincks, Ann. and Mag. Nat. Hist., Aug. 1882.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

This curious and beautiful species forms small, phytoid, branching tufts, attaining a height of an inch or upwards. The basal shoots consist of cylinders of zoœcia and are bi- or trifurcate. They are attached by a mass of radical fibres springing from the surface of the zoœcia. Besides these radical fibres, a few (2 to 7) hollow, chitinous rods arise from the sides of the shoots and are directed upwards. They are beautifully transparent, glassy, and strongly convoluted towards the summit. The summit is expanded into a small disc fringed by a row of long, hollow, articulated spines. Above the expansion a short celliferous branch rises, almost immediately dividing into three, one or more of which may again bifurcate. The zoœcia are arranged in linear series round the axis in such a manner that their apertures form a spiral. The zoœcia immediately succeeding the rods have usually a larger number (3 or 4) of spines than the others. The rods are of considerable length, sometimes more than half as long as the supported branches. The radical fibres proper are of the usual brownish appearance, waving and forming bundles, they are fixed to the supporting body by rosettes.

Explanation of Figures.

Plate 178.—Fig. 4, specimen, natural size. Fig. 4*a*, portion of same, magnified; this was not very perfect and does not properly show the expanded upper parts of the rods. Fig. 5*a*, portion of a branch more highly magnified, showing zoœcia with their spines and avicularia. Fig. 5, small portion from another specimen, to show the oœcia.

Plate 178, Fig. 6.

FARCIMIA APPENDICULATA (Hincks).

[Genus FARCIMIA (Pourtales). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Cellulariidæ.)

Gen. Char.—Zoarium calcareous, erect, branching; stems and branches composed of segments united by corneous joints. Zoœcia arranged in series round an imaginary axis, with elevated margins and depressed area, which is more or less covered in with membrane.].

Description.—Zoarium dichotomously branched, the internodes short and connected by double tubes. Zoœcia arranged round the axis in four series, three or four in each series, alternate, elliptical or ovate, with the sides raised into a thin margin; aperture occupied by a thin membrane which is thickened for a small space inferiorly. A subimmersed avicularium on either side of the zoœcia, those of the adjacent series occupying a separate tract; the anterior surface bounded by a thickened margin, the intermediate part being occupied by a membrane; at the summit a small beak, with sharp, curved point, the mandible pointing outwards.

Reference.—Hincks, Ann. and Mag. Nat. Hist., March 1883.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

The structure of the zoœcia of *Farcimia* undoubtedly places it among the *Cellulariidæ*. The avicularia are comparable, as pointed out by Mr. Hincks, to those of *Scrupocellaria*, from which they differ in having the free side occupied by a membrane and bounded by a thickened band; the beak and mandible are very small. Frequently a peculiar narrow, membranous appendage, terminating in a hard, sharp point, springs from the side of the avicularium.

Explanation of Figures.

Plate 178.—Fig. 6, portion of specimen, natural size. Fig. 6*a*, internode, magnified. Fig. 6*b*, appendage of avicularium.

Plate 178, Fig. 7.

CATENICELLA RINGENS (Busk).

[Genus CATENICELLA (Blainville). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Catenicellidæ.)

Gen. Char.—Branches originating from the summits of each of a geminate pair, or rarely from the sides of ordinary zoœcia. Zoœcia in single series, but at a bifurcation geminate, or each internode consisting of a geminate pair; mouth with simple margins, straight or hollowed and entire below, or with a small rounded notch.]

Description.—Zoarium dichotomously branched. Zoœcia broadly ovate, smooth and shining; a broad anterior vitta on each side extending from the base to near the level of the mouth; a large, lateral process, slightly turned forwards, on each side, with a widely gaping avicularium and a round mark at the base; mouth lofty, slightly hollowed below. Posterior surface smooth.

Reference.—Busk, Brit. Mus. Cat., Mar. Pol., pt. i., p. 10, pl. viii., figs. 3 and 4.

Port Phillip Heads, seemingly very rare.

Easily distinguished by the smooth zoœcia, the anterior vittæ and the large gaping avicularia. The lateral process on one side is frequently larger.

EXPLANATION OF FIGURES.

PLATE 178.—Fig. 7, anterior surface of portion of branch. Fig. 7*a*, posterior surface of ame.

PLATE 178, FIG. 8.

DIMETOPIA HIRTA (McG.).

[Genus DIMETOPIA (BUSK). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Eucrateidæ.)

Gen. Char.—Zoœcia arranged in pairs united back to back, each pair looking at right angles to that below; at a bifurcation the zoœcia of a pair disjunct, and each giving rise to the first pair of a branch.]

DESCRIPTION.—Zoœcia with the aperture very oblique, narrowed below, slightly arched above, margin thickened; 3 to 5 stiff spines articulated above, 3 or 4 very long, submarginal on each side, the uppermost generally a little farther back and directed more posteriorly, usually 2 spines below. Oœcia globular, surmounting the zoœcia.

REFERENCE.—P. H. McGillivray, Tr. Roy. Soc. Vict., Nov. 1885.

Port Phillip Heads.

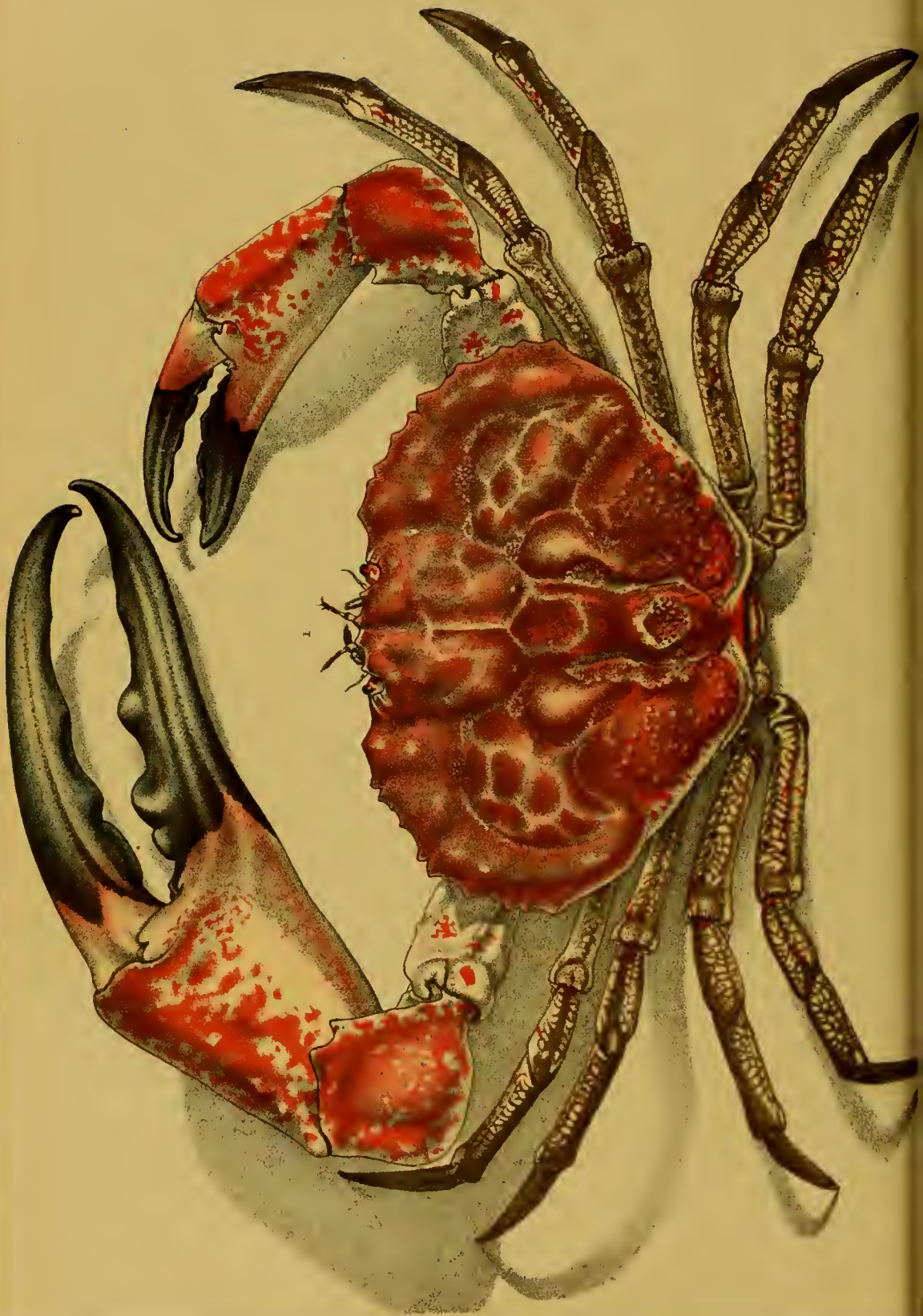
Nearly allied to *D. cornuta*, from which it is distinguished by the difference in number and arrangement of the spines. Of these there are usually 3 short and straight, directed upwards; on each side there are 3 or 4 very long, articulated immediately beyond the margin, the uppermost being situated a little posteriorly and directed more backwards; there is a single one or occasionally two below. The oœcium is globular, surmounting a zoœcium, and in the specimen figured it is embraced by two long spines, one on each side. I am not certain that this arrangement is constant.

EXPLANATION OF FIGURE.

PLATE 178.—Fig. 8, portion of branch, magnified.

The specimens and descriptions of the interesting Polyzoa on this plate are from Mr. McGillivray.

FREDERICK McCOY.



PLATES 179 AND 180.

PSEUDOCARCINUS GIGAS (LAM. SP.).

THE GREAT RED KING-CRAB.

[Genus PSEUDOCARCINUS (MILNE-EDWARDS). (Sub-kingdom Articulata. Class Crustacea. Section Podophthalmata. Order Decapoda. Tribe Brachyura. Family Canceridæ.)

Gen. Char.—Carapace gently arched in front half, narrowed and truncated behind; wider than long, moderately depressed, the various regions and subregions elevated and embossed; front nearly horizontal, lateral anterior margins moderately curved, armed with projections or teeth; posterior lateral margins straight, converging; hind margin narrow, straight; basal joint of the external antennæ very small; second joint scarcely reaching the front; third joint lodged in the orbital hiatus, but not filling it, so that the antennary fossa is not completely separated from the orbit; prelabial space not channelled; first pair of legs, especially in the male, forming very large pincers, the fingers of which are equally rounded and obtuse to the tip, unequal, and armed with very large, bluntly rounded tubercles, fewer and of greater size on the right claw,* which greatly exceeds the left in size. Hinder feet moderately long, simply pointed; abdomen of the male and female divided into seven distinct segments. Indian Ocean.]

DESCRIPTION.—Carapace slightly convex, anterior half tumid, posterior half more flattened, and bent downwards at an angle of about 145° from the anterior half; the protogastric, epibranchial, and metagastric regions tumid and bounded by broad deep furrows; the cardiac region is bounded by two furrows deeper and more angular than the rest, extending nearly to the hind margin; upper surface smooth as far as posterior margin of epibranchial and metagastric regions, behind which the surfaces of the cardiac and mesobranchial and metabranchial regions are rough with scattered conical tubercles of very irregular size. Front between the orbits forming four projecting lobes, between which the middle sinus is smaller than the other two; posterior superior external margin of each orbit incised by two deep parallel fissures; first joint of outer antennæ very small; second joint reaching lower edge of orbit; fourth, half the length of third joint and reaching edge of front; flagellum little larger than anterior lateral portion of the carapace, with about eleven irregular, conical tubercles and divided into four lobes by small indentations on upper surface, but long narrow slits below, each lobe with two or three of the spines. Anterior legs or chelæ very large, the right much larger than the left†; movable finger (dactylopodite) rounded, moderately compressed, abruptly incurved at the obtuse tip; a little shorter than the fixed finger, with three elongate, large, slightly compressed teeth on the basal half of the inner margin, the anterior smallest, posterior largest, a very slight angular projection at about one-fourth the length from the tip; fixed finger slightly longer than the movable one, a little broader and more compressed, but similarly abruptly incurved at the blunt apex; inner margin with three very large, rounded tubercles on basal half, the middle one largest, and a slight compressed one about one-third from the tip; hand (propodite) very broad, rounded externally, moderately convex on inner and outer sides; carpus (carpopodite) with two strong spines on upper inner margin, which has also three or four slight blunt tubercles near its base; next joint (meropodite) trigonal, with the upper, sharp, angular margin with an irregular row of nine or ten blunt tubercles; four posterior pairs of legs, with the terminal joints

* Reversed in our plate. † Reversed in the lithographing of our plate.

(dactylopodites) simply pointed, villous; the next two joints (propodites and carpodites) also villous, the pile forming a close covering on upper margin, but forming a netting to bare spaces on the sides; next joints (meropodites, ischiopodites, basipodites, and coxapodites) nearly naked, but with a row of five to seven irregular, conical tubercles on upper angle, and with one smaller tubercle at middle of upper distal margin, with a few minute tubercles on each side of meropodites. *Colour*: All the underside of body, three basal joints of chelæ, and underside, outerside, and most of innerside of chelæ, including base of pincers, and four hind legs, yellowish cream colour; upper surface of carapace scarlet; upper surface of carpus scarlet, mottled on the sides, with the ground cream colour; upper portion and variable portion of sides of hand mottled scarlet, and the ground cream colour; velvety, close, pilose covering of last joint, and upper edge of the penultimate and antepenultimate joints and the netted pattern on their sides formed by villous lines on the four posterior pairs of legs, of rich dark brown. Two fingers of chelæ rich purplish black. *Measurements of Male*: Width of carapace, 11 ins. 6 lines; length from front to posterior edge, 9 ins.; greatest depth, 5 ins.; length of abdomen, 1 in. 8 lines; greatest width at third segment, 9 lines; length of basal joint (coxa or coxapodite) of chelæ, 1 in.; second joint (or basipodite), 7 lines; third joint (ischium or ischiopodite), 2 ins.; fourth joint (merus or meropodite), 4 ins. 6 lines; fifth joint, carpus (carpodite), 3 ins. 9 lines long, 3 ins. 7 lines wide at distal end; sixth joint (propodos or propodite), 1 ft. 3 ins. from base to tip of fixed finger, 5 ins. 6 lines to base of movable finger, 5 ins. 4 lines wide at distal end, and 3 ins. thick; seventh joint or movable finger (dactylopodite), 10 ins.; width at base, 2 ins. 3 lines; terminal joint (dactylopodite) of first pair of legs, 2 ins. 9 lines; penultimate joint (propodite), 2 ins. 6 lines; antepenultimate (carpodite), 2 ins. 3 lines; preceding joint (meropodite), 4 ins. 6 lines; next joint (ischiopodite), 1 in.; basal joint (coxapodite), 1 in. *Female:* Much smaller than male, and with all the regions of the carapace set with irregularly sized and spaced conical tubercles about their middles, the boundaries of each region and subregion being smooth. Anterior chelæ very much smaller than in the male, and more nearly equal to each other, and the fingers of the pincers much shorter and tuberculated from base nearly to apex. In addition to the spines on the carpus and other portions of the legs, as in the male, the hand has three or four large conical spines near base of upper rounded margin, and an irregularly scattered and sized series of smaller conical tubercles thence to base of movable finger (dactylopodite). About five large blunt tubercles on inner edge of movable finger, extending from base nearly to the tip, and four rather larger on corresponding intervals of fixed finger on right hand. On left, or smaller, chelæ the fixed finger is much more compressed on inner edge, and the four or five tubercles still more compressed and less prominent than on the right. Inner edge of fixed finger much more compressed and with proportionately much smaller, more compressed, and less prominent tubercles than on right side. Abdomen enormously large, of seven very distinct segments. *Measurements:* Length of carapace from front to posterior margin, 8 ins. 6 lines; greatest width, 10 ins. 6 lines; length of abdomen, 8 ins.; greatest width (at sixth segment), 4 ins. 2 lines; length of right hand from carpus to tip of fixed finger, 6 ins. 6 lines; length of movable finger, 3 ins. 2 lines; greatest width of hand at base of movable finger, 3 ins.

REFERENCE.— =*Cancer gigas*, Lam., Hist. des An. sans vert, v. 5, p. 272; Milne-Ed. Hist. Nat. des Crust., v. 1, p. 409.

This gigantic and beautifully coloured crab is now figured entire and of the colours of life for the first time. It is not uncommon at the western extremity of the coast-line of the colony, particularly

about Portland, from whence examples are often brought to the fish-market. The small female with the much smaller claws seems more common than the great male with its immense powerful pincers.

Explanation of Figures.

Plate 179.—Fig. 1, female, about one-third natural size. Fig 1*a*, abdomen of female, one-third the natural size. Fig. 1*b*, antennules, or inner antennæ, movable portion without great fixed base, twice the natural size. Fig 1*c*, antennæ, or outer antennæ, without the small basal joint, twice the natural size. Fig. 1*g*, mandible and first and second maxillipedes, natural size. Fig. 1*d*, third or external maxillipede, natural size. Fig. 2, abdomen of male, one-third natural size.

Plate 180.—Fig. 1, male, about one-third natural size. (For abdomen, see pl. 179, f. 2).

Frederick McCoy.

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N.B.—The originals of all the Figures are in the National Museum, Melbourne.

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Natural History of Victoria.

PRODROMUS

OF THE

ZOOLOGY OF VICTORIA;

OR

FIGURES AND DESCRIPTIONS OF THE LIVING SPECIES OF ALL CLASSES

OF THE

VICTORIAN INDIGENOUS ANIMALS.

DECADE XIX.

BY

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M DCCC LXXXIX.

ADVERTISEMENT.

It having been considered desirable to ascertain accurately the natural productions of the Colony of Victoria, and to publish works descriptive of them, on the plan of those issued by the Governments of the different States of America, investigations were undertaken, by order of the Victorian Government, to determine the Geology, Botany, and Zoology of the Colony, to form collections illustrative of each for the public use, and to make the necessary preparations for such systematic publications on the subject as might be useful and interesting to the general public, and contribute to the advancement of science.

As the geological and botanical investigations have already approached completion, and their publication is far advanced, it has been decided now to commence the publication of the third branch completing the subject, namely, that of the Zoology or indigenous members of the different classes of the animal kingdom.

The Fauna not being so well known as the Flora, it was a necessary preliminary to the publication to have a large number of drawings made, as opportunity arose, from the living or fresh examples of many species of reptiles, fish, and the lower animals, which lose their natural appearance shortly after death, and the true characters of many of which were consequently as yet unknown, as they had only been described from preserved specimens. A Prodromus, or preliminary issue, in the form of Decades, or numbers of ten plates, each with its complete descriptive letterpress, will be published, of such illustrations as are ready, without systematic order or waiting for the completion of any one branch. The many good observers in the country will thus have the means of accurately identifying various natural objects, their observations on which, if recorded and sent to the National Museum, where the originals of all the figures and descriptions are preserved, will be duly acknowledged, and will materially help in the preparation of the final systematic volume to be published for each class when it approaches completion.

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PREFACE.

The first plate in this Nineteenth Decade represents one of the most curious of the small Lizards of the Colony, remarkable for the entire absence of external ear-drums, the *Tympanocryptis lineata*.

The second plate figures for the first time the natural colours of life of one of the largest of the so-called Whiting, amongst our best food fishes, the *Sillago ciliata*.

The third plate represents the Skipjack of all English-speaking fishermen, the *Temnodon saltator*, remarkable for its almost world-wide distribution, and which is common in our Bay and fish shops most months of the year.

The fourth plate represents, for the first time of the natural colours, another of our very common food fishes, popularly called Roughy, the *Arripis Georgianus*.

The next three plates are devoted to illustrations of Mr. MacGillivray's contributions of specimens to the Museum, and descriptions of our Victorian Polyzoa.

Plate 188 represents the so-called Cuttle-fish bone of our commonest species of *Sepia*, not, however, figured before, the *Sepia apama*.

And the last two plates represent, of the colours of life, the details of the soft parts of the Cuttle-fish from which the bone, figured on plate 188, was extracted, also unfigured before.

The succeeding Decades will illustrate as many different genera as possible, and deal first, usually, with species of some special interest, and of which good figures do not exist, or are not easily accessible.

Frederick McCoy.

2nd July, 1889.

Dr Weber del et lith

Government Printing Office

PLATE 181.

TYMPANOCRYPTIS LINEATA (PETERS).

THE WHITE-STREAKED EARLESS LIZARD.

[Genus TYMPANOCRYPTIS (PETERS). (Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Sub-order Pachyglossæ. Tribe Strobilosaura. Family Agamidæ.)

Gen. Char.—Head short, rounded; no external ear-drum. Body broad, depressed; tail long, tapering, round. Scales of back irregularly flat, scale-shaped, or spinose; no dorsal crest. No gular sack; a strong transverse gular fold; one preanal pore on each side, sometimes absent in female; no femoral pores. Australia.]

DESCRIPTION.—Body short, thick, fusiform; tail little longer than the head and body. When the hind leg is drawn forward along the side, the longest toe reaches the shoulder. Head short, blunt, semioval, with a convex profile arched downwards from the occiput; nostril in a large nasal plate, a little nearer to the eye than to the tip of the snout. Scales of head irregular in size and shape, very strongly keeled; those of back strongly keeled, chiefly small and rhombic, but with numerous larger, conical, compressed, arched, spinose scales, very irregularly scattered, not forming distinct continuous keels, except one from end of mouth to shoulder, and a shorter and less distinct one over its hinder half; a strong ridge-like fold from axil to thigh on each side; scales of throat, belly, and underside of thighs rhombic, posterior angle prominent and middle slightly convex but not distinctly keeled; scales of upper and under sides of tail very strongly keeled, forming continuous ridges. *Colour:* Pale brown above, ashy white below; head, two rows of large quadrate spots along back, and transverse bands on upper surface of legs and thighs and across the tail, of dark rich chocolate-brown, becoming paler on posterior half of tail, and forming ashy brown, irregular, transverse bands on sides; five narrow white lines, one in middle of back from occiput to base of tail, one on each side (often interrupted) from head to anterior third of tail, and one on each side, coinciding with the prominent lateral fold from axil to thigh; a conspicuous, narrow, whitish, open chevron mark crosses the head from a little behind middle of each eye, with a round white spot in front of it, and one smaller near tip of snout and one on each side; a few irregular whitish marks on sides and back of head. Throat strongly mottled with broad, irregularly flexuous, longitudinal, blackish bands; belly more faintly mottled or plain ashy white. *Measurements:* Total length, 4 in. 8 lines; length of head, 6½ lines; width of head, 6 lines; width of body, 7 lines; length of body, 1 in. 8 lines; length of tail, 2 in. 5½ lines; length of fore limb, 11 lines; length of hind limb, 1 in. 3 lines; from axil to thigh, 1 in. 1 line.

REFERENCE.—Peters Monats Bericht. Berlin Akad., 1863, p. 230.

The species of *Tympanocryptis* are remarkably distinguished from all of the genus *Grammatophora* or *Amphibolurus* by the ear-openings being absent or entirely concealed by being covered over by the ordinary scales of the adjacent parts of the head. The

present species, at first glance, resembles the young of the *G. muricata* or "Blood-sucker" of colonists, figured on our plate 111, so much as to be easily mistaken for it. The absence of the large distinct external tympanum easily distinguishes it, however, as well as the shorter blunter head ; the large pointed scales being irregularly scattered instead of forming distinct median and lateral keels, and the absence of femoral pores on the underside of the thigh are also ready distinctions. Most specimens have no preanal pores, but occasionally there is one large, prominent preanal pore on each side, as in the genus *Diporophora* (which, however, has distinct external ear-drums).

The habits of this little Lizard are entirely different from those of the *G. muricata*, never ascending trees or bushes like that creature, but inhabiting stony plains and retreating into small holes, like those of the "Trap-door Spider," in the ground when alarmed.

Not very uncommon at Essendon and plains near Sunbury, &c., to the north of Melbourne.

This interesting reptile has not been figured before.

EXPLANATION OF FIGURES.

PLATE 181.—Fig. 1, average specimen, natural size, side view. Fig. 1*a*, head, viewed from top, magnified two diameters. Fig. 1*b*, head and neck, side view, showing absence of ears, magnified two diameters. Fig. 1*c*, front view, showing large chin plate, magnified two diameters. Figs. 1*d*, 1*e*, underside of foot, magnified two diameters. Fig. 1*f*, preanal pores, magnified three diameters. Fig. 1*g*, scales of neck, magnified three diameters to show spines. Fig. 1*h*, spinose scales of dorsal portion of side and smooth scales of ventral portion of side, magnified three diameters. Fig 2, another specimen, viewed from above. Fig. 3, young, short-tailed specimen, about entering hole.

FREDERICK MCCOY.

ZOOLOGY OF VICTORIA
(Fishes)

A. Bartholomew del. et Lith.

Prof. F.ᵗ Coy. direx.ʳ

Steam. Litho. Govt. Printing Office

PLATE 182.

SILLAGO CILIATA (CUV. AND VAL.).

THE PLAIN WHITING.

[Genus SILLAGO (CUVIER). (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygii. Family Trachinidæ.)

Gen. Char.—Body elongate, subcylindrical, moderately compressed; head conical; mouth small, with thick lips; upper jaw a little longer than the lower, protrusile; eyes lateral and a little upwards; teeth in cardiform patches on jaws (outer row sometimes longer) and vomer, none on palatines. Operculum with a sharp posterior spine; preopercula serrated, approaching each other below. Branchiostegal rays six. Scales of moderate size, ctenoid. Two contiguous dorsals, the first high, of nine to twelve slender spines, the hinder longer but lower. Pectorals moderate; ventrals thoracic, of one spine and five rays; anal like second dorsal. Bones of head with wide muciferous ducts. Pseudobranchiæ. Air-bladder simple. Pyloric cæca few. Red Sea to S. Australia.]

D. 11 + 1/17; A. 2 + 16; P. 15; V. 1 + 5; C. 19; L.l. 70 $\frac{6}{13}$ (about fourteen rows of additional minute scales on caudal fin).

DESCRIPTION.—Greatest depth over middle of pectoral in front of dorsal; declining thence with slight convexity to the thick compressed pedicle of tail; more convexly arched to eye, from whence the profile of the conical compressed head is nearly straight in its downward slope to the very small protrusile mouth, with thick fleshy lips; smooth portion of head from eye to maxillary on side with wide shallow muciferous openings and channels; space on top of head nearly flat, very slightly convex, covered with large scales nearly half-way from eye to snout; cheeks, operculum, and preoperculum covered with scales larger than on top of head; posterior vertical and horizontal edge of preoperculum serrated; operculum with one, angular, flat spine a little above base of pectoral. *Teeth:* About twelve rows of minute, within the outer row of larger, ones on jaws. *Fins:* First dorsal high, of eleven slender spines, second longest; interval between dorsals less than between spines of first dorsal; second dorsal lower than the first, declining gradually from the first branched ray, which is longer than the spine, to the posterior end; caudal concave, with thick branched rays; anal similar in shape to second dorsal, but shorter and less deep; pectoral moderate, triangular; ventrals a little behind base of pectorals. A row of small, oblong, transverse scales behind each spine and ray of dorsal and anal fins. *Colour:* Back dark brownish-olive with bluish and green reflections, brighest on nape; pale-brownish on sides, fading into pearly-white along belly and underside of tail; head purplish-brownish; iris white, with yellow border; caudal fin dark brownish-olive, rays lighter, membrane spotted with black, posterior edge and lower edge darkest; first dorsal nearly colourless, with faint blackish clouds; second dorsal with six to nine rows of narrow, transverse (fore and aft), oblong, brown marks, with rather wider pale intervals on the membranes; pectoral pale-yellowish, nearly colourless, with a large purplish-black spot at its base. Ventral and anal fins bright rich kings-yellow. *Measurements:* Length of figured specimen, 1 ft. 5 in. 6 lines. Comparative measurements to length, as 100:—Tip of snout (protruded) to anterior edge of eye, $\frac{12}{100}$; to posterior edge of eye, $\frac{17}{100}$; to first ray of dorsal, $\frac{33}{100}$; to edge of operculum, $\frac{24}{100}$; to first ray of second dorsal, $\frac{52}{100}$; to base of pectoral, $\frac{25}{100}$; to first ray of ventral, $\frac{27}{100}$; to first ray of anal, $\frac{56}{100}$; to last

ray of dorsal, $\frac{77}{100}$; to last ray of anal, $\frac{75}{100}$; space between eyes, $\frac{5}{100}$; length of caudal fin, $\frac{13}{100}$; greatest height of first dorsal, $\frac{15}{100}$; greatest height of second dorsal, $\frac{9}{100}$; greatest depth of anal, $\frac{7}{100}$; first ray of ventral, $\frac{11}{100}$; length of pectoral, $\frac{12}{100}$. Five scales in length of 1 inch at middle of body; four in same space vertically.

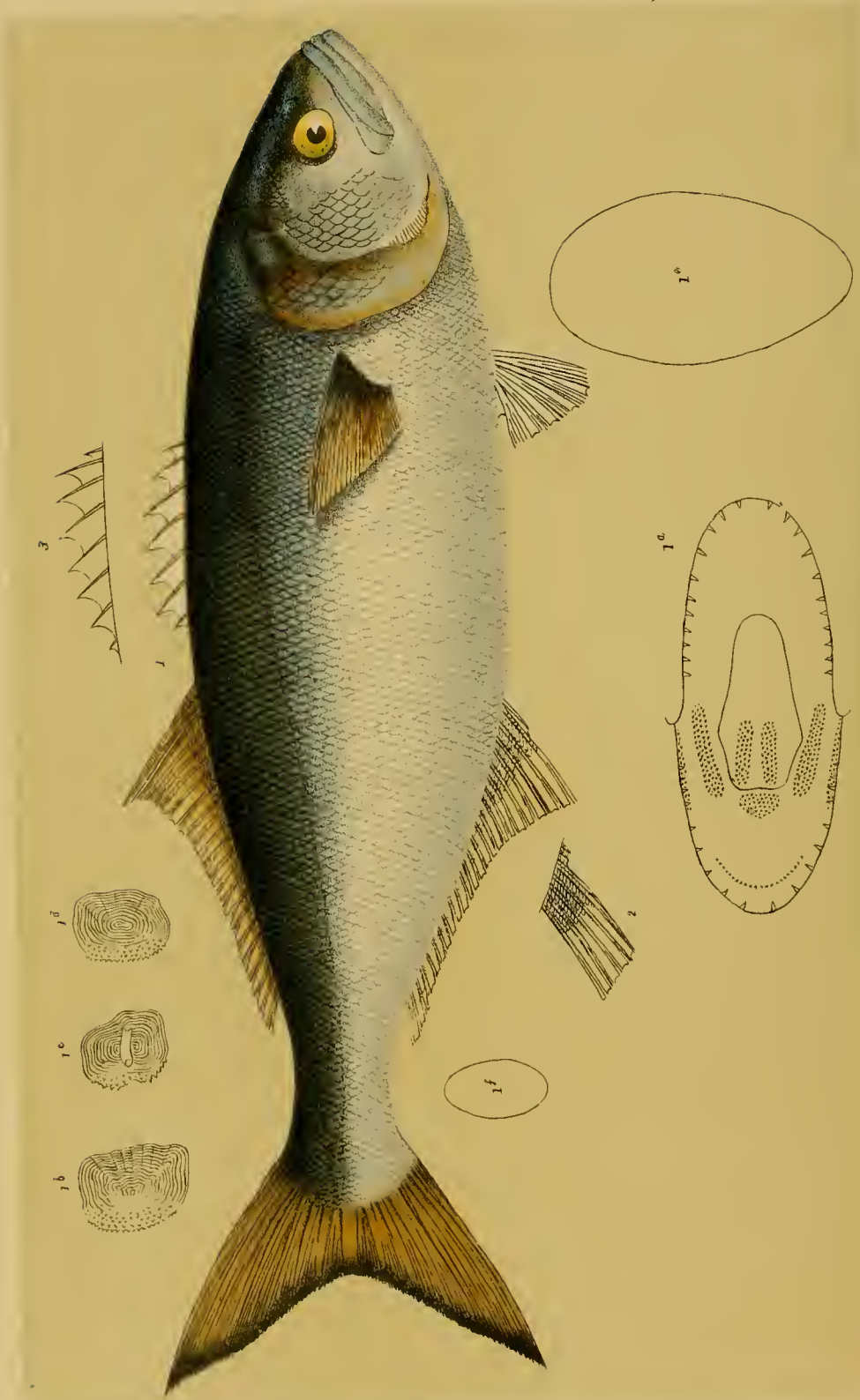
Reference.—Cuv. and Val., Hist. Nat. des Poiss., v. 3, p. 415.

This is a rare fish in Victoria, sometimes named "Sydney Whiting" by fish dealers, who call all the species of *Sillago* "Whiting," not from any identity of the external characters, but from the similarity of the delicate white flesh, which is so good as to be welcome at the best tables. The popular name of "Plain Whiting" is appropriate, as it has none of the spots or stripes of the other species. Not figured before.

Explanation of Figures.

Plate 182.—Fig 1, side view, about half the natural size. Fig. 1*a*, upper jaw, outer row of conical teeth and inner rows of minute cardiform teeth on sides of jaw, and patch of cardiform teeth on vomer. Fig. 1*b*, teeth of lower jaw. Fig. 1*c*, spine and two rays of second dorsal, to show the row of small scales behind each, natural size. Fig. 1*d*, scale from above lateral line, twice the natural size. Fig. 1*e*, scale of lateral line, twice the natural size. Fig. 1*f*, scale from back of rays of dorsal fin, magnified four diameters. Fig. 1*g*, section of pedicle of tail. Fig. 1*h*, section behind pectoral.

Frederick McCoy.



A Barthelomew del et lith.

Prof. McCoy dirext.

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PLATE 183.

TEMNODON SALTATOR (LIN. SP.).

THE SKIPJACK.

[Genus TEMNODON (Cuv.). (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygii. Family Carangidæ.)

Gen. Char.—Body oblong, moderately compressed; tail without keel or armature; preoperculum striated and serrated at lower edge. Jaws with a row of strong, lancet-shaped cutting teeth in front, and large bands of minute cardiform teeth on the palatine bones, vomer, and tongue. First dorsal fin of seven or eight slender spines with delicate membrane, capable of being hid in a groove at base; second dorsal and anal fins long, triangular, covered with a thick, slightly scaly skin; two minute spines, often hid in skin, in front of base of anal; no finlets; ventrals thoracic; branchiostegals seven; a simple swim-bladder; pyloric appendages numerous; scales moderate, subquadrate, ciliated and granulated posteriorly, with a faintly marked fan of about five rays in front, extending over the operculum and cheeks; the suboperculum, interoperculum, lower part of preoperculum, snout, and round eye bare.]

D. 8 + 1.23; P. 15; V. 1 + 5; A. (0, or 1, or 2) + 1.24; C. $20\frac{2}{3}$; L.l. 85–90 $\frac{5-8}{17-20}$.

DESCRIPTION.—Elongate ovate, depth nearly $4\frac{1}{2}$ in total length, including caudal fin; abruptly narrowed behind dorsal and anal fins; head with profile descending with slight convexity; end of maxillary reaching nearly to vertical of posterior margin of eye; lower jaw protruding in front of upper one; preoperculum striated and distinctly serrated on lower edge; operculum with a deep notch, having two, rounded, sub-angular lobes above base of pectoral; first dorsal rounded, fourth ray longest, eighth ray shortest; second dorsal triangular, third ray longest; anal like the second dorsal, and both covered with a thick, slightly scaly skin; the two minute spines in front of anal distinct in some small specimens, scarcely perceptible to the touch in most adults, and only one in some specimens; ventrals slightly behind the pectorals, united at base; caudal of two pointed lobes with a deep angular indentation in the middle. *Teeth:* About eleven on each side of lower jaw and nine on each side of upper jaw of the large teeth, standing about their length apart; a row of very small, simple, conical teeth behind the large ones in front of upper jaw; a large triangular patch of minute cardiform teeth on the vomer, and an elongate patch of similar ones on each palatine bone, and a smaller oblong patch on each side of the base of the tongue. Lateral line nearly coinciding with the line of the back, and at about one-fourth the depth from it, with simple distinct tubes of about ninety scales; scales spinulose and serrated on posterior edge; eight above and twenty below the lateral line. *Colour:* Blackish-grey or lead colour above, with purplish and steel-blue and green reflections in large specimens, brighter blue in young individuals; smooth part of top of head blackish-purple; cheeks and sides of body lighter than back, with the reflections from the scales producing a longitudinally striped effect; throat and belly pearly-white; pectoral fin with dusky membrane, blackish at base, and with first simple ray black; the spotted rays greyish, speckled with black, membrane dull

yellowish near base, colourless or smoky beyond; first dorsal with the rays blackish, membrane colourless, except at triangular blackish patch in front of the base of each ray; second dorsal dull blackish-olive, minutely crossed with lines of minute black specks; anal like the dorsal but a little lighter; caudal blackish-olive, darkest at upper, lower and posterior margins; iris yellowish. Total length from tip of snout to tip of caudal, 1 ft. 7 in. Proportional measurements to length (taken as 100):—Length of head from snout to end of operculum, $\frac{22}{100}$; from tip of snout to anterior margin of orbit, $\frac{7}{100}$; length of orbit, $\frac{4}{100}$; tip of snout to base of pectoral, $\frac{24}{100}$; length of pectoral, $\frac{13}{100}$; greatest depth of body, $\frac{22}{100}$; greatest thickness of body, $\frac{13}{100}$; tip of snout to base of ventrals, $\frac{25}{100}$; length of ventrals, $\frac{9}{100}$; tip of snout to front of anterior dorsal, $\frac{32}{100}$; greatest height of first dorsal, $\frac{4}{100}$; space between dorsals, $\frac{3}{100}$; length of second dorsal, $\frac{24}{100}$; greatest height, $\frac{9}{100}$; length of caudal at ends, $\frac{18}{100}$; length of caudal in middle, $\frac{8}{100}$; length of anal, $\frac{22}{100}$; greatest height of first branched rays, $\frac{3}{100}$. Number of scales in $\frac{1}{2}$ in. near middle of side, three.

References.—= *Gasterosteus saltatrix*, Lin. Syst. Nat., p. 421; = *Chilodipterus heptacanthus*, Lacép 3, p. 542, t. 21, f. 3; = *Temnodon heptacanthus*, Quoy and Gaim. Voy. Freyc., Zool., t. 61, f. 2, p. 400; = *Scomber plumbeus*, Mitchel, L. and P. S. N. York, v. 1, p. 424, t. 4, fig. 1; De Kay, Fish, F., N. York, p. 130, t. 26, f. 81.

This is certainly identical with the "Skipjack" of English-speaking fishermen in Carolina and S. Africa, as well as various parts of Australia, and is the famous "Blue Fish" of the coasts of New York. Like De Kay, several observers have not found the eighth ray spoken of by Cuvier in the first dorsal, probably from looking at the wrong end; it is very minute and behind the last spine. The two minute spines concealed in the skin in front of the anal fin are certainly absent in most specimens but very distinct in young ones, and perhaps may be a sexual character. It is by some oversight, I suppose, that Dr. Günther and Sir W. Macleay in their Catalogues state the scales to be cycloid; they are certainly ctenoid. I only find seven rays to dorsal in most large specimens such as that here figured, not eight as in Günther's and Macleay's works, agreeing thus with Quoy and Gaimard and with De Kay; but in small specimens the eighth may usually be found, as in our figure 3. The row of small conical teeth inside the outer row of large ones in the upper jaw I find constant, but they seem to have been overlooked by most observers, except Quoy and Gaimard and Cuvier and Valenciennes.

One of the commonest of the food fishes supplied to the market of Melbourne from all the neighbouring coasts, usually about a

foot long, but occasionally more than double that size, and I have seen one caught in June, 1888, 3 ft. $2\frac{1}{2}$ in. long. It is moderately good for the table.

Explanation of Figures.

Plate 183.—Fig. 1, average specimen, half the natural size; eighth dorsal spine is absent. Fig. 1*a*, mouth, natural size, showing outer row of conical teeth, smaller inner row on upper jaw, with cardiform patches on hinder edges of upper jaw, palatine bones, vomer, and base of tongue. Fig. 1*b*, scale, twice the natural size, from below lateral line. Fig. 1*c*, scale from lateral line, twice the natural size. Fig. 1*d*, scale from above lateral line, twice the natural size. Fig. 1*e*, section behind pectoral. Fig. 1*f*, section of pedicle of tail. Fig. 2, anal from another specimen, showing two additional short spines in front. Fig. 3, first dorsal fin, showing eight rays, from another specimen.

Frederick McCoy.

ZOOLOGY OF VICTORIA

(Fishes.)

A. Barraclough del. et lith.

Prof. M.c Coy direct.

Steam Lith. Govt. Printing Office

PLATE 184.

ARRIPIS GEORGIANUS (CUV. AND VAL.).

THE ROUGHY.

[Genus ARRIPIS (JENYNS). (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygii. Family Percidæ.)

Gen. Char.—Form moderately elongate, fusiform. Branchiostegal rays seven. Gill openings large. All the teeth villiform; numerous rows of teeth on the palatine bones and on the vomer. Tongue smooth. One dorsal fin, with nine slender spines and several branched rays; anal fin with three spines and several branched rays; caudal fin deeply forked; pectoral small; ventrals a little behind base of pectorals. Operculum with one or two spines at upper posterior edge. Preoperculum denticulated on basal and ascending edge. Infraorbital bone slightly denticulated. Maxillary bone with scales. Scales very finely ciliated at posterior edge; anterior fan of diverging ridges nearly or quite obsolete, replaced by fine close striæ, parallel to the anterior truncated margin. Air-bladder simple. Pyloric appendages numerous. Confined to Australia.]

D. 9.14; A. 3.10; V. 1.5; P. 16; C. 18; L.l. $54\frac{6}{2}$ (seven or eight rows of small scales, beyond those fifty-four of lateral line, on tail).

DESCRIPTION.—General form of the body fusiform, moderately compressed, the curve of the back much less convex than that of the ventral outline. Height of body from 4 (at base of ventrals) to $3\frac{1}{2}$ (at greatest depth, opposite eighth spine) in large, or $4\frac{1}{3}$ in small specimens, in total length, including caudal fin; thickness rather less than half the depth; length of head about 5 to $5\frac{1}{5}$ in total length; diameter of eye about one-quarter the length of head in largest specimens, one-third in small ones. Fourth dorsal spine longest. The two spines of the operculum are very visible in small specimens of the ordinary dimensions of 9 inches, both standing out as smooth angular projections, the lower a little more acute than the upper; but the upper one is scarcely visible in the very large specimen measured below, being in it, and all approaching it in size, broad, longitudinally ridged, and so obtuse as to lose the spine-like character of the young. One to two rows of scales on maxillary bone; lower and ascending edge of preoperculum distinctly serrated in the small specimens; but almost smooth in the very large. Lower edge of suborbital bone from anterior half of lower edge of orbit to snout with coarse sulci extending downwards and backwards, roughly serrating the lower edge, especially in small specimens. Snout short, obtuse; the lower jaw very slightly longer than the upper. Scales very finely serrated on posterior margin; the anterior portion marked with vertical lines of growth, and quite without radiating fan-like ridges. Lateral line about one-quarter of depth of body below dorsal profile. *Colour:* Top of head dark-olive to level of eye, with a paler extension round the eye. Top of snout of both jaws, blackish. Back dark olive-grey with bronze and steel-blue reflections. Sides gradually getting lighter to ventral edge; rather more than one-third of each scale in the longitudinal rows darker and more olive than the lighter greyer interval, forming sixteen or seventeen longitudinal stripes, fainter towards the belly. Cheeks pearly, with bronze reflections on operculum, the upper posterior edge and a spot about middle of anterior edge, darker; throat and maxillary white; iris bronze, yellowish, and green. *Fins:* Light-grey, speckled with black; dorsal and anal flecked with blackish; an imperfect, narrow, blackish edge to dorsal; ventral nearly colourless; caudal darkest, blackish-olive, with the posterior margin and tips black; pectoral dark, but less so than caudal. *Measurements:* Very

P.S.—By a mishap plate 184 has been spoiled at the last moment. The belly of the fish should be white, with a slight pearly-purple tinge. The latter color has been printed full strength, unfortunately, but the reader must suppose it to be absent, like lower part of tail.

large specimen: 1 foot 4 in. 3 lines from snout to tip of caudal fin. Proportional measurements to this length, as 100: length of head, $\frac{20}{100}$; snout to eye, $\frac{6}{100}$; diameter of eye, $\frac{5}{100}$; space between eyes, $\frac{8}{100}$; greatest depth of body, $\frac{29}{100}$; snout to origin of dorsal, $\frac{21}{100}$; length of dorsal, $\frac{40}{100}$; height of fourth spine, $\frac{10}{100}$; length of caudal lobes, $\frac{20}{100}$; ditto in middle, $\frac{6}{100}$; length of pectoral, $\frac{12}{100}$; snout to ventral, $\frac{26}{100}$, snout to anal, $\frac{62}{100}$; length of ventral, $\frac{12}{100}$; length of third anal spine, $\frac{6\frac{1}{2}}{100}$; first anal branched ray, $\frac{7\frac{1}{2}}{100}$; length of base of anal, $\frac{11}{100}$. Average-sized specimen: from snout to tip of caudal fin, 9 in. 3 lines. Proportional measurements to this length, as 100: length of head, $\frac{20}{100}$; snout to eye, $\frac{6}{100}$; diameter of eye, $\frac{6}{100}$; space between eyes, $\frac{7}{100}$; greatest depth of body, $\frac{26}{100}$; snout to origin of dorsal, $\frac{29}{100}$; length of dorsal, $\frac{40}{100}$; height of fourth spine, $\frac{12}{100}$; length of caudal lobes, $\frac{22}{100}$; ditto in middle, $\frac{5}{100}$; length of pectoral, $\frac{13}{100}$; snout to ventral, $\frac{28}{100}$; snout to anal, $\frac{60}{100}$; length of ventral, $\frac{13}{100}$; length of third anal spine, $\frac{6}{100}$; first anal branched ray, $\frac{8}{100}$; length of base of anal, $\frac{12}{100}$.

References.—Rich., E. and T., p. 117, t. 54, f. 3 to 6; = *Centropristes Georgianus*, C. and V., Hist. Nat. des Poiss. v. 7., p. 451.

The name Roughy is popularly given in Victoria to this fish from the remarkable roughness to the touch which the serration of the posterior edge of each of the very large scales gives the surface, although it is really as fine as I figure it. It is somewhat like the Skipjack in usual size, shape, and colour, although the two fish may be distinguished at a glance by the continuity of the spinous and branched rays of the dorsal in the Roughy, and the two portions forming distinct fins in the Skipjack, in which also the large teeth of the jaw show the generic difference at once.

The outer rows of teeth are rather smaller than the others in the Roughy or *A. Georgianus*.

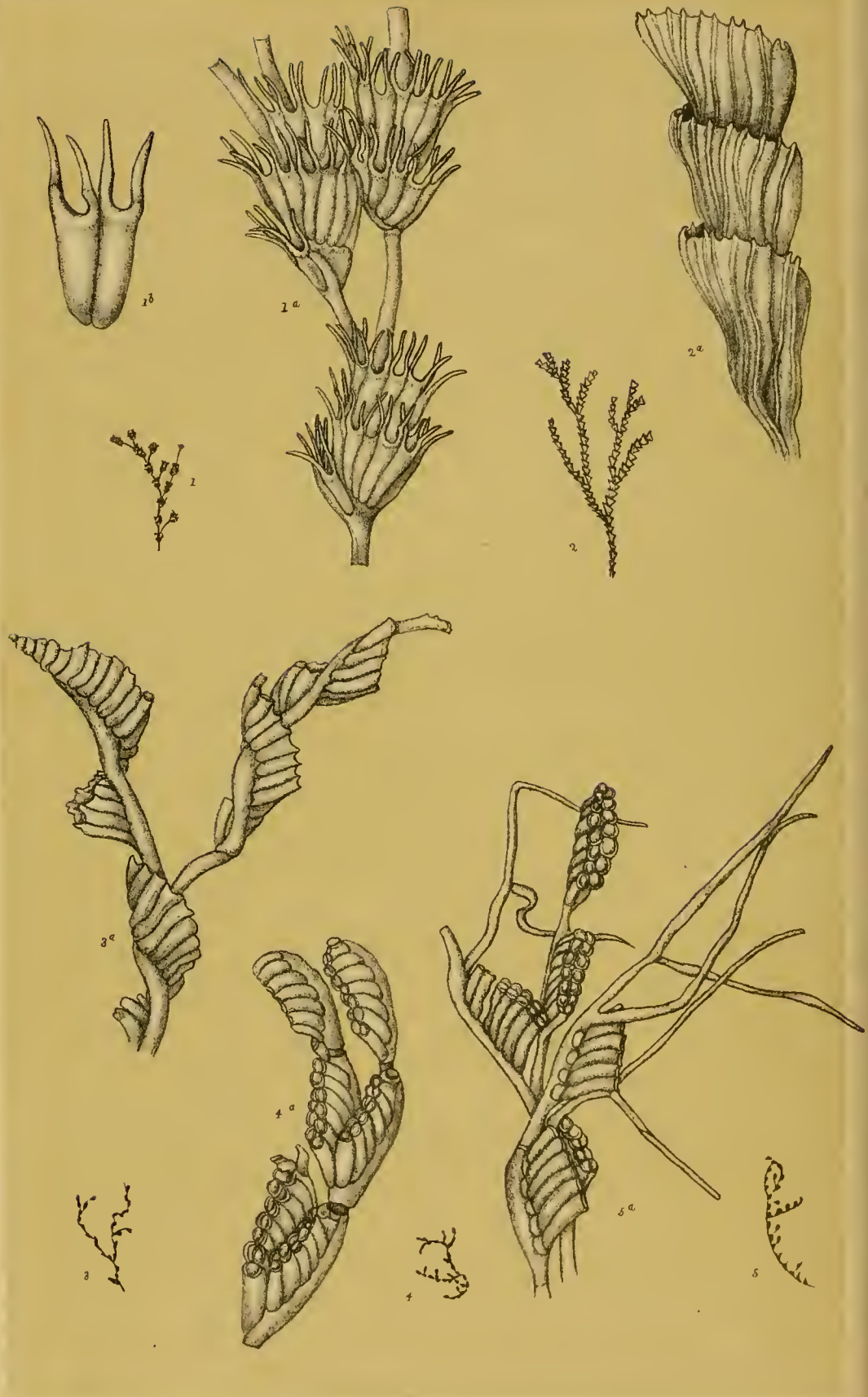
The very large specimen figured has (as usual) the head and eye smaller in proportion than in the small, usual size, and in it the two spines on posterior edge of operculum are much less marked, the upper one much broader and divided by ridges, and the serration of the preoperculum obsolete.

Not figured of the colours of life before.

Explanation of Figures.

Plate 184.—Fig. 1, very large specimen (over 16 inches long), about one-half natural size. Fig. 1*a*, mouth, natural size, showing cardiform teeth on jaws, vomer, and palatine bones, and smooth tongue. Fig. 1*b*, scale from lateral line, magnified two diameters. Fig. 1*c*, scale from below lateral line, magnified two diameters, showing serrated posterior edge, and absence of fan on anterior covered portion. Fig. 1*d*, scales from middle of body, one and a half times the natural size, to show colouring. Fig. 1*e*, scales from nape, twice the natural size, to show colouring. Fig. 1*f*, section behind pectoral. Fig. 1*g*, section of pedicle of tail. Fig. 2, head of smaller specimen (9 inches long), natural size, to show the two distinct spines on operculum at that size.

Frederick McCoy.



P.H. Macgillivray del.
J. Kipper lith.

Prof. M.Coy direxit.

Steam. litho. in the Printing Office

PLATE 185, FIG. 1.

AMATHIA BICORNIS (TENISON-WOODS).

[Genus AMATHIA (LAMOUROUX) = SERIALARIA (LAMARCK). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Ctenostomata. Family Vesiculariidæ.)
Gen. Char.—Zoarium radicate, erect or creeping, with free filiform dichotomous branches. Zoœcia sub-tubular, connate, in two parallel rows, continuous or in distinct groups which are placed on one or two sides of the branches or wound spirally, partially or wholly, round them.]

DESCRIPTION.—Zoœcia of moderate height, deeply hollowed above (when dry), with a long hollow process on each side at the summit, arranged in close spiral clusters of about two whirls, the basal clear parts of the internodes being about the same length as the clusters.

REFERENCES.—*Serialaria spiralis*, Tenison-Woods, Trans. Roy. Soc. N. S. Wales, 1877, p. 84; *Amathia bicornis*, Tenison-Woods, Tr. Roy. Soc. Vict., June, 1879.

Port Phillip Heads.

Forms dense masses of a brownish colour, the largest I have being about an inch and a half in each direction. The close double spiral clusters, separated by clear portions of the branches of about the same length, with the peculiar hollow processes from the summits of the zoœcia, are sufficiently distinctive.

EXPLANATION OF FIGURES.

PLATE 185.—Fig. 1, part of specimen, natural size. Fig. 1*a*, small portion of same, magnified. Fig. 2*b*, two zoœcia, more highly magnified.

PLATE 185, FIG. 2.

AMATHIA SPIRALIS (LAMX).

DESCRIPTION.—Zoarium forming large tufts of dichotomously divided branches. Zoœcia very long and narrow, arranged in a continuous spiral round the branches, interrupted only at the bifurcations.

REFERENCE.—Lamouroux, Hist. des Polyp. Corall. Flex., p. 161, pl. iv., fig. 2.

Port Phillip Heads.

This species occurs in tufts several inches in height. The zoœcia form a continuous spiral round the branches, interrupted only at the bifurcations. They are separated by deep grooves, but in dried specimens, as in that figured, they become depressed and the partitions appear as prominent ridges. The united separating walls of contiguous zoœcia project upwards as blunt points (more prominent when dried). It is at once distinguished from the other species by its stoutness, the uniform length of the zoœcia and the closeness of the spiral entirely concealing the branches except at the bifurcations. There can be no doubt that this is Lamouroux's species. That described and figured by Busk as *A. spiralis* in the "*Challenger*" Polyzoa is quite different.

EXPLANATION OF FIGURES.

PLATE 185.—Fig. 2, branch, natural size. Fig. 2*a*, portion of same (dried), magnified.

PLATE 185, FIG. 3.

AMATHIA TORTUOSA (TENISON-WOODS).

DESCRIPTION.—Zoarium slender, straggling, of a dull olive colour; branches clear and glassy. Zoœcia slender, of moderate height, arranged in long spiral clusters extending from two-thirds to more than a complete turn round the axis, and leaving a clear space at the base of the internode.

REFERENCES.—*A. tortuosa*, Tenison-Woods, Tr. Roy. Soc. Vict., 1879. *A. connexa*, Busk, "*Challenger*" Polyzoa, pt. ii., p. 35, pl. vi., fig 3.

Port Phillip Heads; Sealers' Cove, Baron von Mueller.

I believe that this is the species intended by Mr. Woods, although it does not quite agree with his figure and description. Mr. Busk, however, was doubtful as to the identification and named this *A. connexa*, considering another allied species, which he describes and figures, to be the true *A. tortuosa*.

The branches are colourless, very clear, and glassy. The zoœcia are of moderate height, of nearly uniform size, although usually rather shorter distally, and are arranged in an open spiral forming a nearly complete turn. The figure, taken from a dried specimen, does not show the characters so satisfactorily as one preserved in spirit, and I shall therefore give a fresh one when figuring the remaining species of the genus.

Explanation of Figures.

Plate 185.—Fig. 3, portion of specimen, natural size. Fig. 3*a*, portion of same, magnified.

Plate 185, Fig. 4.

AMATHIA INARMATA (McG.).

Description.—Zoœcia arranged in unilateral biserial groups of 4-9 pairs, occupying nearly the whole length of the internodes which are slightly arcuate, of moderate height, slightly diminishing towards the distal extremity.

Reference.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov., 1886.

Port Phillip Heads.

This is considered by Kirkpatrick (Ann. and Mag. Nat. Hist., July, 1888) to be the *A. biseriata* of Krauss. I have not seen Krauss's work (Corallinen und Zoophyten der Sudsee), and therefore cannot say whether this identification is correct. South African specimens, however, which I have received from Dr. Pergens as *A. biseriata* are certainly different.

The extent of internode occupied by the clusters varies, these sometimes extending almost the whole length, at other times a considerable portion at the base being bare.

Explanation of Figures.

Plate 185.—Fig. 4, portion of specimen, natural size. Fig. 4*a*, part of same, magnified.

PLATE 185, FIG. 5.

AMATHIA AUSTRALIS (TENISON-WOODS).

DESCRIPTION.—Zoœcia arranged in straight unilateral clusters of 5-7 subalternate pairs, of nearly uniform thickness, diminishing in height from the proximal to the distal; the terminal clusters having beyond the distal zoœcia a pair of large, confervoid, and frequently branched processes; a similar process often replacing a branch at a bifurcation.

REFERENCES.—*Serialaria Australis*, Tenison-Woods., Proc. Roy. Soc. N. S. Wales, 1877; *Amathia Australis*, T.-Woods, Tr. Roy. Soc. Vict., 1879.

Port Phillip Heads.

Occurs in loose tufts several inches in height. The zoœcia usually diminish in height from the proximal to the distal, but are occasionally nearly equal throughout the clusters. At a bifurcation one branch is frequently represented by a confervoid filament similar to those at the extremities of the terminal clusters.

This species is probably the *A. cornuta* of Lamouroux. His figure, however, represents the zoœcia as increasing in height from the proximal to the distal, and as there is, therefore, some doubt about the determination, it is better to adopt Mr. Tenison-Woods' name.

EXPLANATION OF FIGURES.

PLATE 185.—Fig. 5, portion of specimen, natural size. Fig. 5*a*, part of same, magnified.

The specimens and descriptions illustrated by this plate are from Mr. MacGillivray.

FREDERICK MCCOY.

ZOOLOGY OF VICTORIA
(Polyzoa)

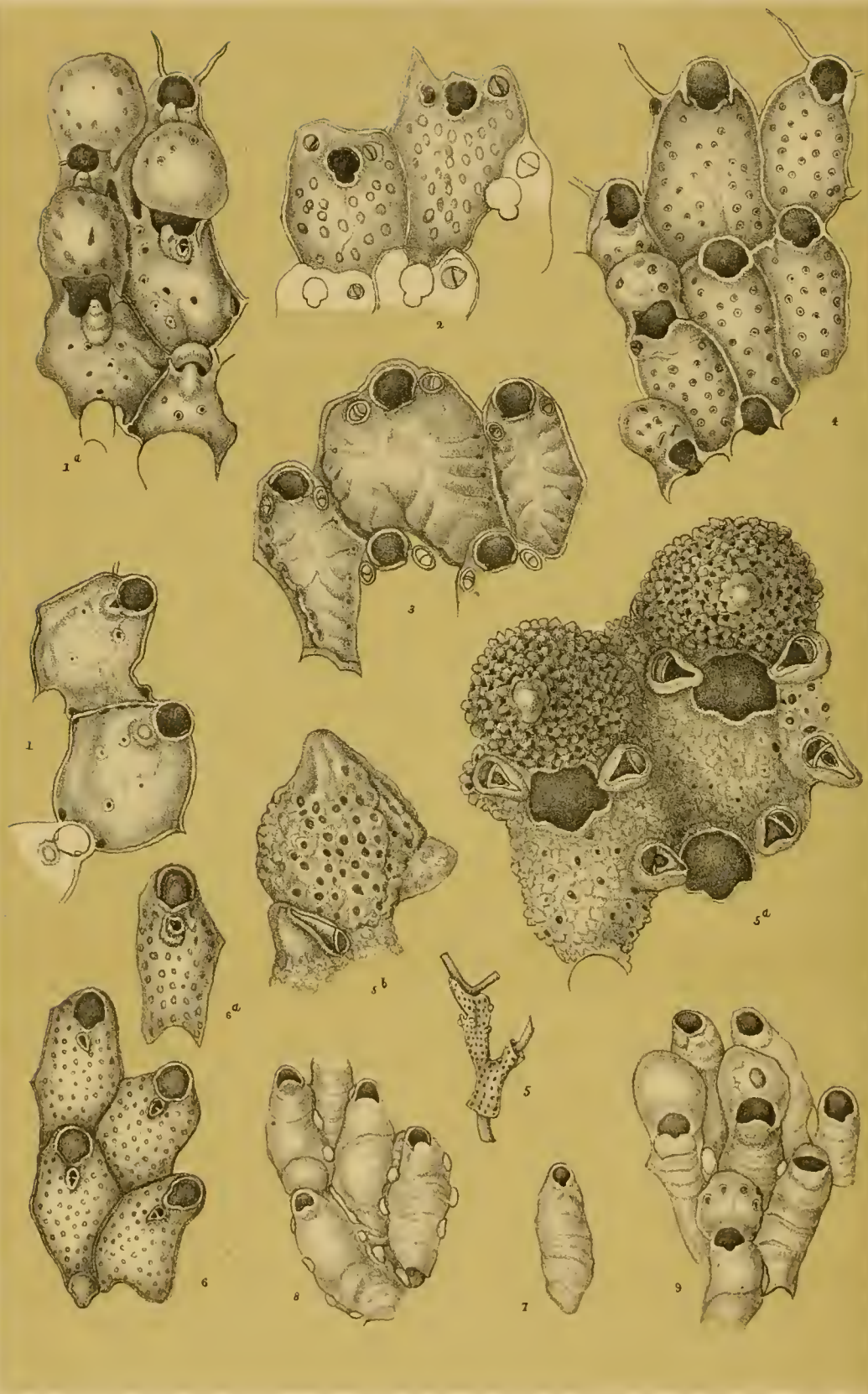


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PLATE 186, FIG. 1.

SCHIZOPORELLA ROSTRATA (McG.)

[Genus SCHIZOPORELLA (HINCKS). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Escharidæ).

Gen. Char.—Zoarium encrusting, or erect and foliaceous, or columnar and branched. Zoœcia closely adherent to each other; lower lip with a distinct notch or sinus; no true peristome]

DESCRIPTION.—Zoarium encrusting. Zoœcia rhomboidal, separated by narrow, sharply-raised margins, very slightly convex or nearly flat, silvery, with numerous faintly-bordered pores; mouth with a wide shallow sinus in the lower lip and a minute denticle on each side internally; an elevated process immediately below the lower lip, on the inner aspect of which is an avicularium with the triangular mandible pointed upwards. Oœcia large, globular, surface punctate or obscurely perforated.

REFERENCE.—P. H. MacGillivray, Trans. Roy. Soc. Vict., Nov., 1886.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

EXPLANATION OF FIGURES.

PLATE 186.—Fig. 1, two young zoœcia. Fig. 1*a*, another portion from same specimen, showing older zoœcia and oœcia.

PLATE 186, FIG. 2.

SCHIZOPORELLA WOOSTERI (McG.).

DESCRIPTION.—Zoœcia broad, subquadrate, separated by distinct raised margins, surface granulated; mouth subcircular, with a wide rounded sinus below. An avicularium, with semicircular mandible, on each side of the mouth at the upper angles of the zoœcia.

REFERENCE.—P. H. MacGillivray, Trans. Roy. Soc. Vict., July, 1886.

Queenscliff, Mr. Wooster.

EXPLANATION OF FIGURE.

PLATE 186.—Fig. 2, small portion of specimen, magnified.

PLATE 186, FIG. 3.

SCHIZOPORELLA PULCHERRIMA (McG.).

DESCRIPTION.—Zoœcia separated by narrow raised lines, broad and nearly flat, surface hyaline, traversed by faint lines converging from minute pores or depressions at the margins; mouth very wide, edge thickened, contracted towards the base, and the lower lip forming a shallow sinus or nearly straight. A broadly elliptical avicularium placed obliquely on each side of the mouth.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov., 1885.

Port Phillip Heads.

The only specimen I have seen is in the hemeschara form. It is not complete, measures three-eighths of an inch across, and is remarkable for the small amount of calcareous matter, being very thin and translucent.

EXPLANATION OF FIGURE.

PLATE 186.—Fig. 3, portion of specimen, magnified. The middle zoœcium is probably formed by the fusion of two.

PLATE 186, FIG. 4.

SCHIZOPORELLA LATISINUATA (HINCKS).

DESCRIPTION.—Zoarium encrusting. Zoœcia large, broad, separated by raised thickened margins, surface punctate and perforated—when recent, covered by a delicate epitheca; mouth arched above, with a wide notch beneath, not contracted at its opening; edge of mouth slightly thickened. Oœcia large, globose, granular, or perforated, frequently personate.

REFERENCE.—Hincks, Ann. and Mag. Nat. Hist., Aug., 1882.

Port Phillip Heads.

The form of the mouth in the figured specimen differs somewhat from that given by Mr. Hincks, the sinus in the lower lip being narrower and deeper, and the border of the mouth thinner.

In other specimens, however, it is much shallower and scarcely distinguishable. The separating margins at their junctions with the sides of the mouth occasionally rise to form an acute angle projecting forwards.*

Explanation of Figure.

Plate 186.—Fig. 4, portion of specimen, magnified.

Plate 186, Fig. 5.

SCHIZOPORELLA BITURRITA (Hincks).

Description.—Zoarium thick, encrusting algæ. Zoœcia confused, indistinct, large, oblong; surface granular and perforated; mouth very large, with a deep, wide, rather pointed sinus in the lower lip. A large triangular avicularium on the inner side of a thick calcareous process on either side of the mouth. Oœcia large, conical, surmounted by a thick, prominent umbo; surface strongly granular and perforated.

Reference.—Hincks, Ann. and Mag. Nat. Hist., Oct., 1884.

Port Phillip Heads.

This very peculiar and striking species is readily distinguished. It forms thick, calcareous layers, usually surrounding the stems of small dark algæ. The zoœcia are very indistinct, little prominent except immediately below the mouth. The surface is covered with granulations and pores. The mouth is very large and wide, with a broad sinus in the lower lip. On each side of the mouth is a stout, calcareous process, on the inner aspect of which is a large, triangular avicularium with the mandible pointed upwards. The upper part of this process is mamilliform and nearly smooth, the lower part granular. The oœcia are very large, mamilliform, surmounted by a nearly smooth, blunt umbo; the remainder covered with large granulations and round pores. These granulations and pores are arranged in more or less radiating and concentric series.

Explanation of Figures.

Plate 186.—Fig. 5, specimen, natural size. Fig. 5*a*, two zoœcia and oœcia, magnified. Fig. 5*b*, oœcium and oral avicularium seen in profile.

*Since the above was printed I have received specimens precisely agreeing with Hincks' figure and description, and differing a good deal in the mouth from those previously examined by me. I will give a figure, with description, in another plate. It may be doubted whether the present should not be considered a distinct species.

PLATE 186, FIG. 6.

SCHIZOPORELLA PACHNOIDES (McG.)

DESCRIPTION.—Zoarium encrusting. Zoœcia elongated, irregular in shape, separated by distinct grooves with an elevated line at the bottom; surface covered with small elevations, or, from the opening of these, white-bordered pores; mouth lofty, horse-shoe shaped, with a wide, deep sinus in the lower lip; margin thickened, especially below; upper border becoming thickened and raised with age. An avicularium, with the triangular mandible pointed straight or obliquely downwards, on a slight elevation below the mouth. Oœcia of moderate size, rounded, finely granular.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Nov., 1886.

Port Phillip Heads.

EXPLANATION OF FIGURES.

PLATE 186.—Fig. 6, group of zoœcia, magnified. Fig. 6*a*, single zoœcium.

PLATE 186, FIGS. 7–9.

SCHIZOPORELLA HYALINA (LINN. SP.).

DESCRIPTION.—Zoarium thin and silvery. Zoœcia in more or less radiating lines, closely united or separated by punctures, elongated, smooth, or transversely rugose; mouth subcircular, lower lip entire or with a sinus. Oœcia large, globose, smooth, vertically carinate, or umbonate, or granular, or perforated.

REFERENCES.—*Schizoporella hyalina*, Hincks, Brit. Mar. Pol., p. 271, pl. xviii., figs. 8–10; pl. xlv., fig. 2. *Lepralia hyalina*, Busk, Brit. Mus. Cat. Mar. Pol. pt. ii., p. 84; pls. lxxxii., xcv., ci.

On algæ, shells, and stones, common.

This cosmopolitan species usually occurs in small circular colonies on algæ or shells. The zoœcia are thin and hyaline, arranged in irregularly radiating lines, either closely united or separated by intervening perforated spaces, the parts between the perforations being hollow or tubular. They are generally much

elongated and transversely rugose. Sometimes, however, they are quite smooth. The mouth varies considerably, being either subcircular and entire or with a sinus in the lower lip. The part immediately below the mouth is frequently produced upwards and forwards into a transverse umbo obscuring the lower lip. The oœcia also vary very much. They are crowded towards the centre of the zoarium where they frequently present somewhat the appearance of a Cellepore. The ovicelligerous zoœcia, as pointed out by Mr Hincks, are mostly small and aborted.

The following varieties have been distinguished :—

Var. α: *cornuta.*—A stout tubular process on each side of the mouth.

Var. β: *incrassata.*—Walls thickened and opaque.

Var. γ: *tuberculata.*—A number of tubercles on the front of the zoœcia, and often a strongly developed umbo below the orifice.

Var. δ: *pellucida.*—Described and figured in Plate 38, fig. 9, of the present work as *Lepralia pellucida.* Zoœcia very thin and pellucid, mouth small and sinuated. Oœcia smooth and carinate.

There is some difference of opinion as to the generic position of the species, it presenting several of the characters of *Chorizopora. Schizoporella,* however, seems to be its proper place.

Explanation of Figures.

Plate 186.—Fig. 7, single zoœcium, showing a sinus in the lower lip. Fig. 8, group of zoœcia from another colony. Fig. 9, part of a colony, showing zoœcia with the lower lip entire or sinuated, and oœcia variously smooth, umbonate, and perforate.

I am indebted to my friend Mr. MacGillivray for the specimens and descriptions of the Polyzoa on this plate.

Frederick McCoy.

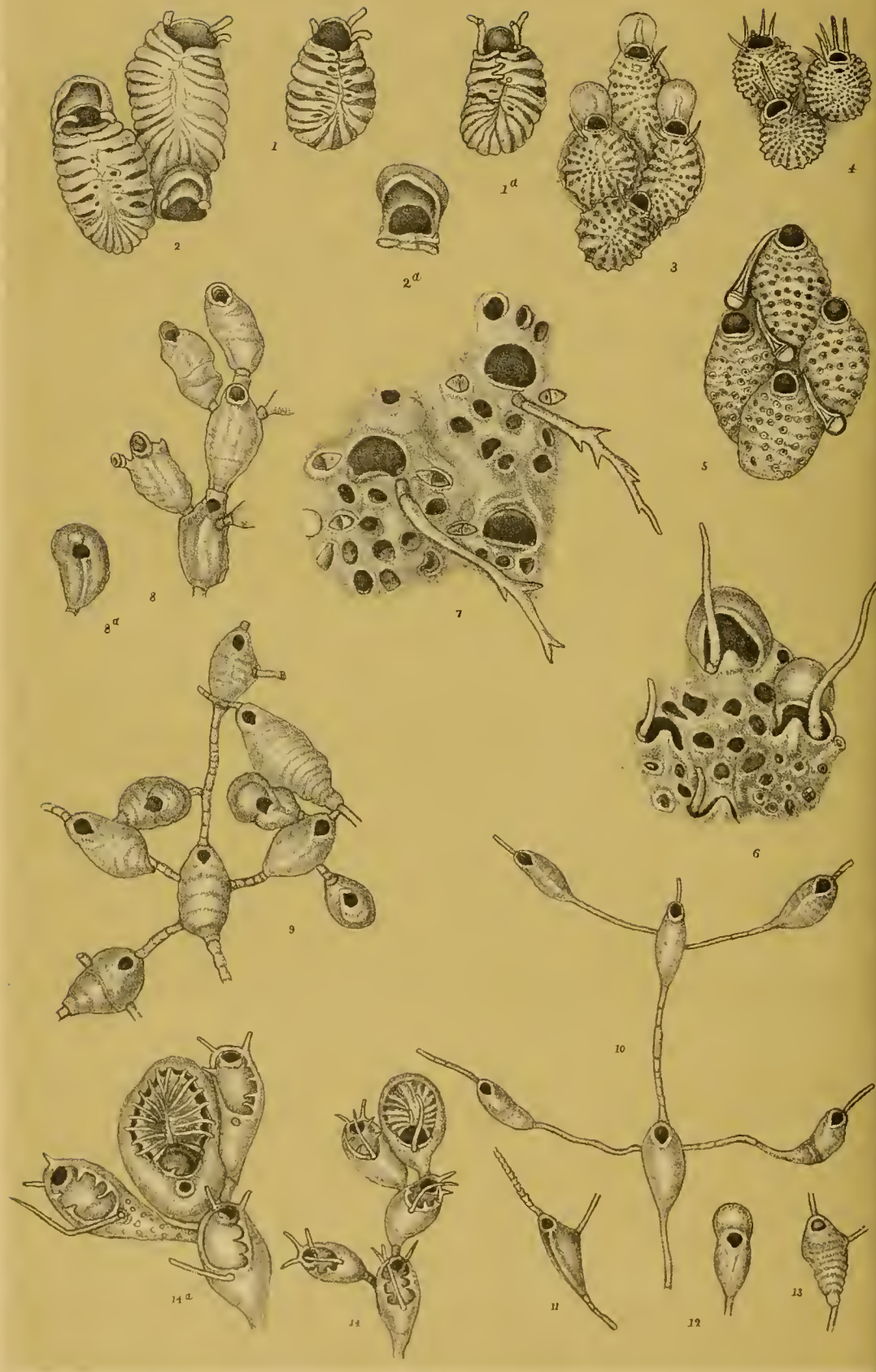

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PLATE 187, FIGS. 1–3.

MEMBRANIPORELLA DISTANS (McG.).

[Genus MEMBRANIPORELLA (SMITT). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Cribrilinidæ.)
Gen. Char.—Zoarium adnate or foliaceous. Zoœcia contiguous or disjunct; front closed by a series of flattened, more or less consolidated, calcareous ribs.]

DESCRIPTION.—Zoœcia contiguous or separated, oval or elongated; ribs 8–11 on each side, a thin raised line down the centre marking the suture of the opposite ribs; mouth with 2–6 thick, articulated spines. Oœcia rounded, with a depressed area separated by a thick margin.

REFERENCE.—P. H. MacGillivray, Trans. Roy. Soc. Vict., July, 1882.

Port Phillip Heads; Warrnambool, Mr. H. Watts.

In young specimens the ribs are seen to bifurcate at the inner extremities. At first they are separated by considerable intervals, but, as growth and calcification advance, they become almost contiguous. The oral spines are thick and occasionally almost pod-like, the first pair frequently larger. The oœcium has a large depressed area in front bounded by a thickened ridge. The ovicelligerous cells have one pair of spines. In the first specimen described the zoœcia are separated by considerable distances, but in others they are closely adjunct, although with a tendency to spread at the edges of the zoarium. It is allied to the European *M. nitida*, from which it differs in the stouter spines and, especially, in the structure of the oœcia. There are no avicularia in my specimens.

EXPLANATION OF FIGURES.

PLATE 187.—Figs. 1 and 1*a*, zoœcia from the disjunct form, young. Fig. 2, zoœcia and oœcia from an older and more calcified specimen. Fig. 2*a*, single oœcium.

PLATE 187, FIGS. 3 AND 4.

CRIBRILINA RADIATA (MOLL. SP.).

[Genus CRIBRILINA (HINCKS). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Cribrilinidæ.)
Gen. Char.—Zoarium encrusting, or adnate, or erect. Front of zoœcia with radiating furrows occupied by regular series of perforations, or irregularly pierced by large, more or less rounded foramina; mouth semicircular or subcircular, entire below.]

Description.—Zoarium crustaceous. Zoœcia closely adjunct or slightly separated and connected by an intervening basis, rounded or ovate; front occupied by 6–10 ribs on each side radiating from a smooth or ridged central spot or line, the intervening sulci pierced by a row of small round foramina; a triangular smooth space below the mouth usually bounded by a raised margin and with a small perforation at the lower part; mouth semicircular, with 4–6 spines on the upper margin and frequently a thin setiform spine on each side below the angle. Oœcia globular, smooth, with a vertical ridge or umbo.

Reference.—*C. radiata* (including *innominata*), Hincks, Brit. Marine Polyzoa, p. 185, pl. xxxvi., figs. 1–9.

Port Phillip Heads, on shells and calcareous nodules.

This beautiful species is subject to considerable variation. The zoœcia are usually ovate or nearly round, sometimes they are narrower and produced below, or they may be very broad. The centre is usually raised into a ridge or keel, terminating above in an umbo; sometimes, however, it is smooth. The aperture in the triangular smooth space below the mouth is by no means constant and the bounding ridge is frequently absent, as are also the setiform spines. The extent and prominence of the oœcial ridge varies. Avicularia are rarely (in Australian specimens) developed between the zoœcia.

There is no doubt that Mr. Hincks is right in uniting *C. radiata* and *innominata*.

Explanation of Figures.

Plate 187.—Fig. 3, small group of zoœcia, with the ribs very prominent and showing the setiform spines. Fig. 4, three zoœcia, from another specimen, slightly separated from each other.

Plate 187, Fig. 5.

CRIBRILINA SETIROSTRIS (McG.).

Description.—Zoarium crustaceous. Zoœcia distinct, elongated, surface with numerous round or pyriform foramina, frequently arranged in irregular single or double transverse rows; mouth arched above, straight below, margin thickened and

frequently produced into a sharp point at the centre of the lower lip. An avicularium at the base of the zoœcium, with a very long setiform mandible directed up one side of the cell.

Reference.—P. H. MacGillivray, Tr. Roy. Soc. Vict., Oct., 1882.

Port Phillip Heads.

This species may be at once recognised by the peculiar avicularia with the long setiform mandibles.

Explanation of Figure.

Plate 187.—Fig. 5, group of zoœcia. In all the lower lip is smooth, but the peristome is very frequently produced into a short, sharp, central process.

Plate 187, Fig. 6.

CRIBRILINA MONOCEROS (Busk).

Description.—Zoarium adherent or hemescharine. Zoœcia with large foramina, the margins of which are thickened; mouth large, the peristome of the lower lip raised into a central pointed process; occasionally two or three thin and furcate spines on the upper margin of the mouth; a thick oral spine on one side of the mouth, within the peristome. Oœcia subimmersed, smooth, or with slight radiating ridges, and frequently with two or more avicularia on elevations. Avicularia absent, or numerous and very variable; in some specimens scattered and usually close to the sides of the zoœcia, with sharp or blunt mandibles; in others very large, with large acute or spatulate mandibles; they are also found sessile on eminences round the mouth, and one occasionally surmounts the mucronate elevation of the lower lip.

References.—Busk, Brit. Mus. Cat., Mar. Pol. pt. ii., p. 72, pl. xciii., figs. 5, 6; MacGillivray, Prd. Zool. Vict., pl. xxxv.

Port Phillip Heads; Portland, Mr. Maplestone; Warrnambool, Mr. Watts.

Two distinct species seem to have been confounded under this name, and I therefore give an amended description and an additional figure of the true *C. monoceros*—that of Busk in the British Museum Catalogue and myself in this work.

Explanation of Figure.

Plate 187.—Fig. 6, zoœcia and oœcia, showing the intra-peristomial spine.

PLATE 187, FIG. 7.

CRIBRILINA ACANTHOCEROS (McG.).

DESCRIPTION.—Zoarium adherent. Zoœcia with large foramina; mouth large, lower lip straight, without mucro; a large spine, very long, and with sharp secondary spines or prickles directed upwards, immediately below the lip and to one side. Oœcia subimmersed, usually with a small mitriform smooth space below, and several large perforations round the upper margin. Frequently a large avicularium, with triangular mandible, at each side of the mouth towards the angle.

REFERENCE.—P. H. MacGillivray, Tr. Roy. Soc. Vict., July, 1886.

Port Phillip Heads; Portland, Mr. Maplestone.

This differs from *C. monoceros* in the following points:—The lower lip is straight and the peristome is not developed into a mucro; the oœcium is somewhat different; and especially the situation of the azygos oral spine is different. In *C. monoceros* it is always situated at one side of the mouth, close to the margin above the angle and is enclosed within the peristome when that is developed. In *C. acanthoceros* the spine, besides being very long and furnished with the peculiar armature, is situated *below* the lower lip, and if a peristome should be developed, which I have never seen, would be outside it.

EXPLANATION OF FIGURE.

PLATE 187.—Fig. 7, two zoœcia, showing oral spines and avicularia.

PLATE 187, FIGS. 8 AND 9.

HIPPOTHOA DIVARICATA (BUSK).

[Genus HIPPOTHOA (LAMOUROUX). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Escharidæ.)

Gen. Char.—Zoarium adnate. Zoœcia distant, connected by creeping tubes so as to form linear series, or partly clustered in small patches; mouth with a sinus in the lower lip.]

DESCRIPTION.—Zoœcia connected by short thick tubes, pyriform, usually carinate, smooth or finely striated, or transversely annulated or corrugated; mouth with a slight notch in the lower lip. Oœcium surmounting a zoœcium, rounded, smooth, or slightly carinate, or with a rounded umbo.

References.—*H. divaricata*, Busk, Brit. Mus. Cat. Mar. Pol., pt. i., p. 30, pl. xviii., figs. 3, 4; Hincks, Brit. Mar. Pol., p. 288, pl. xliv., figs. 1–4; and pl. i., fig. 2; *H. patagonica*, Busk, Brit. Mus. Cat. Mar. Pol., pt. i., p. 30, pl. xvii., fig. 1.

Hobson's Bay and Port Phillip Heads, on algæ, shells, and zoophytes. Usually occurs in slender, silvery, dendritic colonies, the zoœcia being connected by short, rather thick fibres, originating from the summits or sides of the zoœcia in irregular numbers (usually one or two) and occasionally branching from other tubes. The tubes or fibres are smooth or annulated. Their length varies very much, being sometimes considerably longer than the zoœcia, at other times short and scarcely apparent, the result being in the so-called variety *conferta* almost as close an aggregation as in a *Lepralia*, but with a tendency to branch off at the edges. The mouth is expanded above, narrowed below, and has usually a shallow sinus in the lower lip. The oœcium is round or globular, the zoœcium which it surmounts usually smaller than the normal, and frequently originating directly from the side of another. The oœcium also frequently has a round boss or umbo in front. The roughly annulated form is Busk's *H. patagonica.*

Explanation of Figures.

Plate 187.—Fig. 8, portion of a specimen with the zoœcia transversely striated and carinate. Fig. 8*a*, zoœcium and oœcium from the same. Fig. 9, portion of another specimen, with zoœcia mostly annulated and those bearing oœcia arising from the sides of ordinary zoœcia, connecting fibres of considerable length.

Plate 187, Figs. 10–13.

HIPPOTHOA DISTANS (McG.).

Description.—Zoœcia connected by very long, slender threads, small, elongated, smooth, finely striated, or faintly annulated; anterior surface rounded or carinate; mouth subcircular, or wider above and narrowing downwards into a shallow sinus, peristome distinctly thickened. Oœcia globular, terminal, smooth, or umbonate.

References.—*H. distans*, P. H. MacGillivray, Tr. Roy. Soc. Vict., 1868; *H. flagellum*, Hincks, Brit. Mar. Pol., p. 293, pl. xliv., figs. 5—7; Busk, Chall. Pol., pt. i., p. 4, pl. xxxiii., fig. 7.

Hobson's Bay and Port Phillip Heads, on algæ shells and zoophytes, probably common in other localities also. Differs from *H. divaricata* in the zoœcia being much smaller and narrower and the connecting tubes being very long and slender. The zoœcia are usually much elongated, narrow, and smooth, or very faintly striated, and are frequently carinate. The anterior extremity of the zoœcium sometimes projects slightly forwards. The mouth is small, narrowed below into an inconspicuous sinus and has a narrow peristome. In addition to the fibres from the end, very frequently one arises from each side of a zoœcium.

This species and *H. divaricata* are very closely allied, differing chiefly in the zoœcia of the present species being much smaller, narrower, and more elongated, and in the connecting tubes being very long and thin. The oœcium is similar to that of *H. divaricata*, except that it is smaller.

There can be no doubt that *H. flagellum* of Manzoni, Hincks in British Marine Polyzoa, and Busk in the "*Challenger*" Polyzoa, is the same as the present species, an identification which has already been made by Hincks. Both Hincks and Busk describe and figure the zoœcia as smooth and destitute of carina, but in Manzoni's figure of *H. flagellum* they are distinctly carinate.

Explanation of Figures.

Plate 187.—Fig. 10, portion of specimen on shell. Figs. 11, 12, and 13, zoœcia from another specimen on an alga. One zoœcium is very sharply carinate, another strongly annulate, whilst the ovicelligerous one is nearly smooth.

Plate 187, Fig. 14.

ELECTRA AMPLECTENS (Hincks sp.).

[Genus ELECTRA (Lamouroux). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Membraniporidæ.)

Gen. Char.—Zoarium encrusting, or filiform and erect, or foliaceous. Zoœcia elongated, narrow below, closely adherent together, lower part convex; area oval or rounded, occupying the whole width of the zoœcium above, deep, with thickened margins; one or more large, whip-like spines (occasionally replaced by an avicularium) below the margin of the area, and a variable number of short, sharp spines on its circumference.]

Description.—Zoarium encrusting. Zoœcia arranged in single, bifurcating series, pyriform, with smooth surface; aperture oval, occupying more than half the front of the zoœcium and with a slightly thickened margin, covered with a thin membrane; two thin spines above at the upper extremity of the zoœcium and two, or usually three, short, sharp spines on each side of the aperture; a long, flexible spine immediately below the lower edge of the aperture. Oœcia situated above a zoœcium at the bifurcation of a branch, oval, the front surface covered by a series of slender, converging ribs connected by a thin membrane and bounded by a narrow calcareous line, beyond which is a smooth part.

Reference.—*Membranipora amplectens*, Hincks, Ann. and Mag. Nat. Hist., Aug., 1881.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

I have only seen one not very good specimen on a piece of alga, covered also with *Schizoporella hyalina*. It is allied to *E. pilosa*, but is very much smaller. The oœcium is very peculiar. The front wall is covered by a series of slender, white ribs converging to a short line in the lower part. The ribs are bounded externally by a narrow calcareous rim and are connected by a thin membrane which is frequently slightly deficient at the margin. Beyond the ribbed part is a narrow smooth portion.

Explanation of Figures.

Plate 187.—Fig. 14, small portion of a specimen. The zoœcium of the commencing branch at one side of the bifurcation below the oœcium is deficient. Fig. 14*a*, another portion of the same specimen, showing three zoœcia and an oœcium, more highly magnified to show the structure of the latter.

Mr. MacGillivray has contributed the specimens and descriptions for this plate.

Frederick McCoy.

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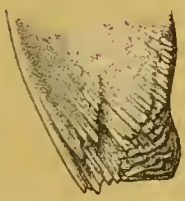

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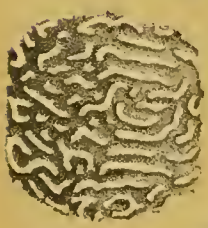

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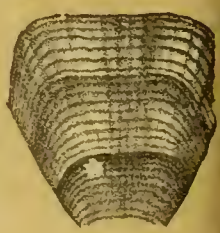

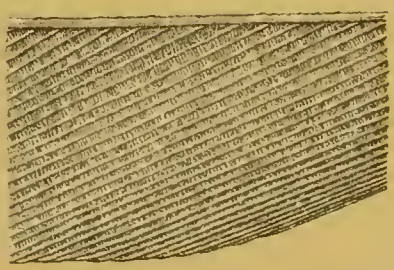

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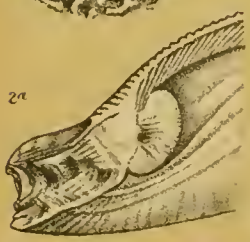

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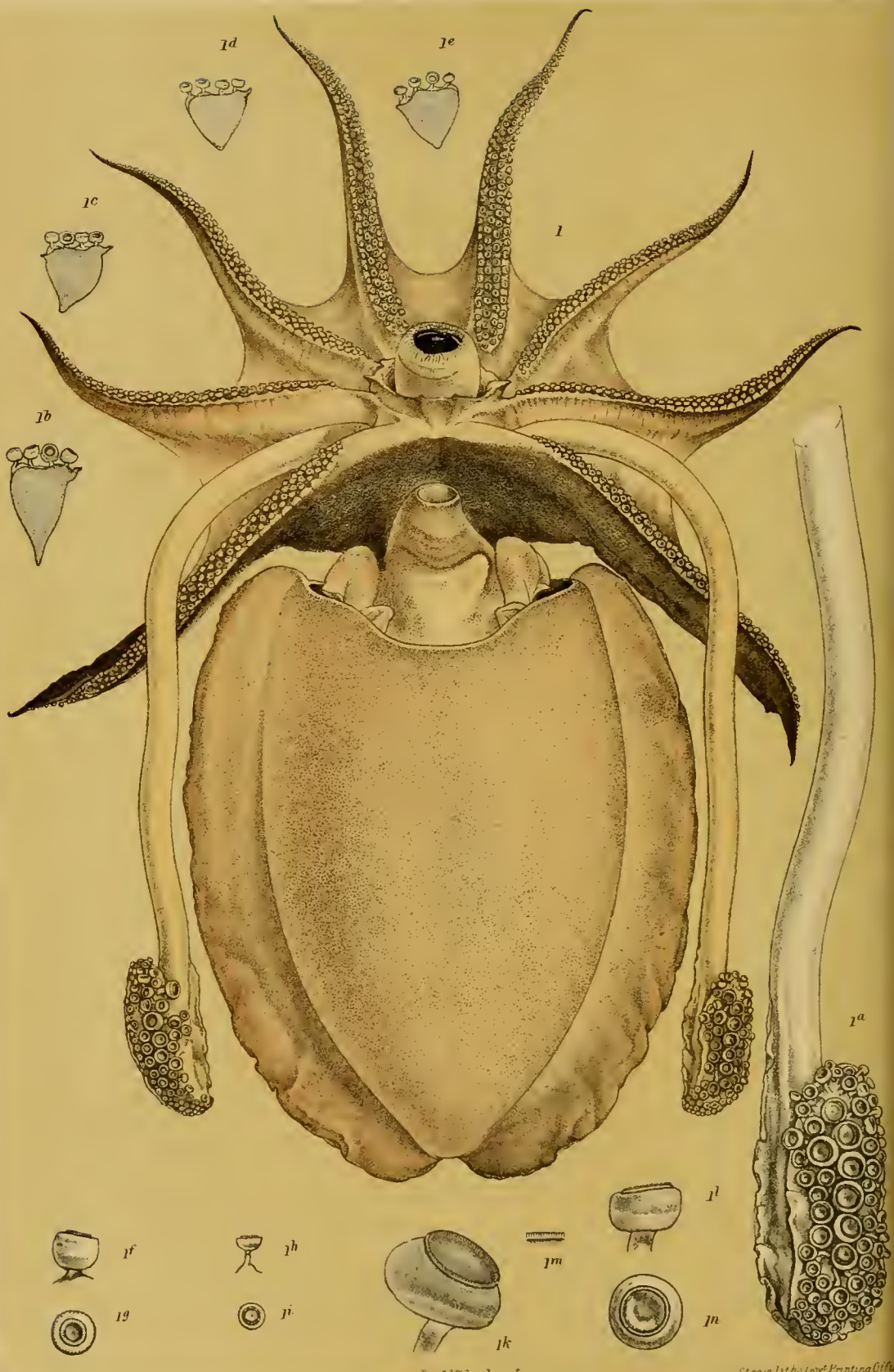

Dr Wild. del. & lith

Prof. McCoy. direx.

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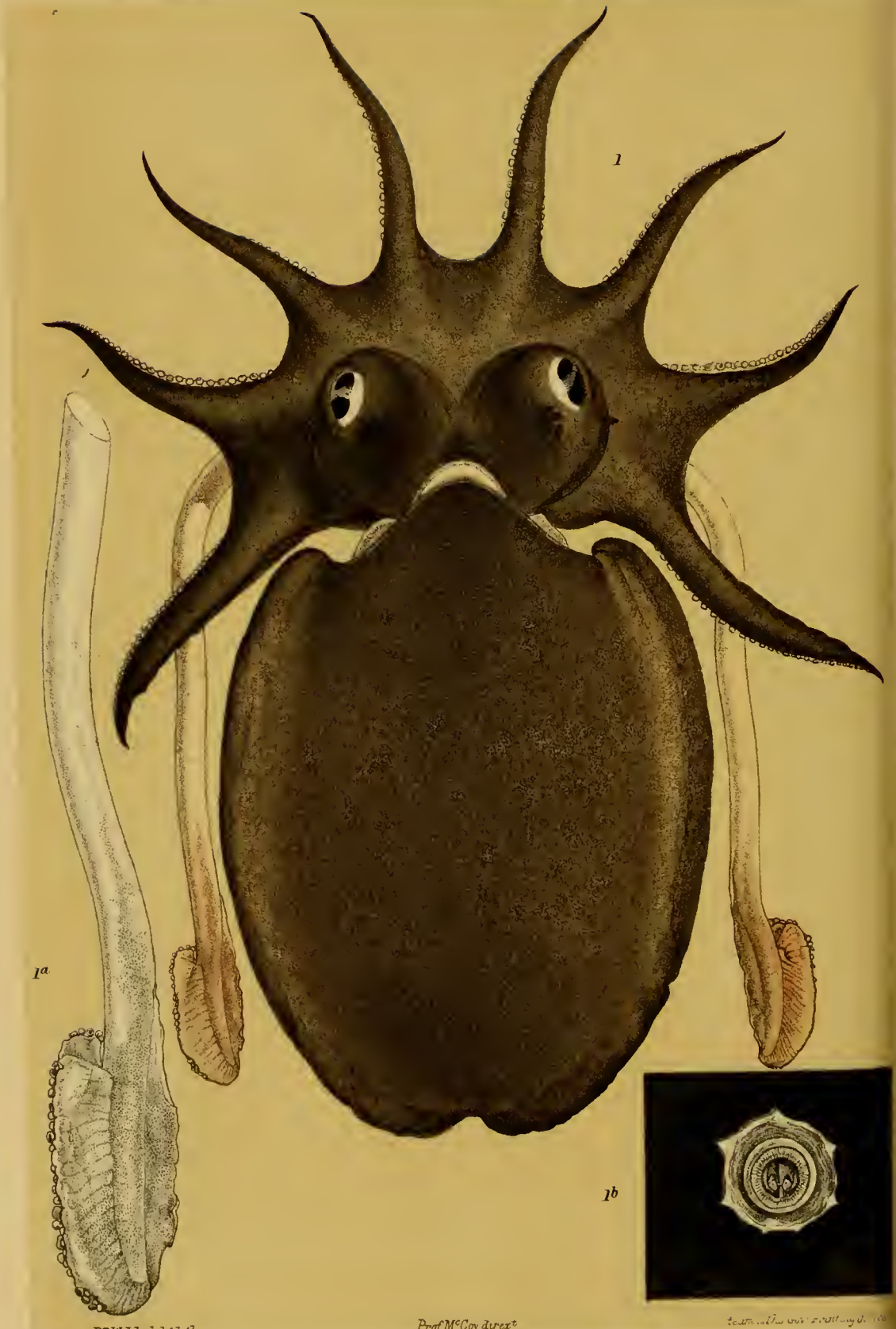

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PLATES 188, 189, AND 190.

SEPIA APAMA (GRAY).

THE LARGE MELBOURNE SEPIA OR CUTTLE-FISH.

[Genus SEPIA (Lin., restricted). (Sub-kingdom Mollusca. Class Cephalopoda. Sub-class Antepedia. Order Sephinia. Family Sepiadæ.)

Gen. Char.—Body short, ovate or oblong, depressed, obtusely rounded behind; front dorsal edge of mantle with rounded angular projection forwards; fins narrow, along whole length of sides of body, disconnected behind. Ventral inner surface of mantle with an oblique oblong tubercle fitting corresponding hollow in sides of siphon; cervical part, under front edge of internal shell, with longitudinal central ridge fitting into groove on back. Head very large, wider than long, without crests or cervical plaits. Eyes very large, lateral, with thick prominent under-eyelid; a lachrymal opening in front of folds of eyelid. Ear opening behind lower part of globe of eye; no auricular ridges; buccal openings six, between bases of arms and lips; buccal membrane with seven lobes, the two ventral smaller. Sessile arms short, strong; third and fourth with crests or membranous fins on back. Sucker cups in four rows, subequal, minutely fringed or toothed, spheroidal, obliquely pedunculated; protecting membranes of cups very short; a web between bases of arms, nearly obsolete between bases of ventral pair. Tentacular arms long, slender, retractile, with large terminal club, having an external fin and several rows of suckers, the horny rings of which are convex in middle of outer face, contracted above and below, and upper edge usually divided into minute, blunt, fringe-like teeth. Siphon large, with large internal valve, without suspensory band of attachment to head. Internal shell calcareous, depressed, thick, oblong or oval, as long as back of mantle in which it is imbedded; back convex, hard, rugose, with horny thin edge, and acute, often spinose, posterior end; concave underface filled with very oblique, cellular, calcareous layers, sometimes with posterior, small, simple, conical cavity behind; no siphuncle.]

DESCRIPTION.—Body thick, fleshy, moderately convex on back, more so on ventral side, smooth, broad-ovate, narrowed behind. Lateral fins rising a little above the edge of mantle anteriorly, rounded at posterior end, leaving a small, angular, obtusely-rounded notch or space with slightly convex, intervening portion of body at posterior end. Sessile arms short, strong, moderately thick; order of length—4, 3, 2 = 1, or 4, 2 = 1, 3, or 4, 3 = 2 = 1; each with four rows of subequal suckers, the compressed horny rim of each of which is set with very numerous, compressed, truncated, fringe-like, short teeth; fin between arms about one-third of their length to upper pairs of arms, and about half the length of ventral pair between them and next pair, but nearly obsolete between the bases of two ventral arms. Two tentacular arms reaching about twice the length of the club beyond end of body; club dilated abruptly, auriculate, extended inwards when reflexed (outwards when directed forwards), and obtusely plicated transversely on back, with a short narrow fin on outer (when turned back, inner when turned forward) straight edge; five rows of suckers, three outer rows smallest, inner row larger and median rows largest, all with numerous, minute, truncated, fringe-like teeth on compressed horny edge; seven or eight very large cups (counted in the longitudinal direction), with about three smaller at base and five at apex of same row. Head large, transversely oblong, a little less than opening of mantle; eyes very large, with very thick underlid; a group of three to five caruncles over each eye, and two or three smaller ones below, behind middle; anterior dorsal edge of mantle broadly semioval; ventral moderately concave. Buccal membrane with seven lobes, one point between bases of dorsal arms, one on each side over bases of next pairs of arms, one on each side between bases of next pair of arms (or over base

of tentacular arms), one on each side of base of ventral arms; lips with numerous small wattles; beak sharp, black. *Colour:* Dark-purple on back and upper surface of head, paler at sides and base of fins, the narrow outer edges of which are darker; lower or ventral side paler; tentacular arms and inner face of sessile arms whitish. *Measurements:* Length from anterior dorsal edge of mantle to interval between fins behind, 8 inches; from ventral edge of ditto, 6 in. 7 lines; width of fins at middle, about 1 in.; width of body without fins, about middle, $4\frac{1}{2}$ in.; length of tentacular arms, 11 in. 6 lines; length of suckered club, 1 in. 9 lines; width of club, including 3 lines of inner fin, 1 in.; length of inner fin, 2 in. 9 lines; longest (ventral fourth) sessile arm, 6 in. 9 lines; next (third) pair, 5 in. 6 to 8 (on two sides) lines; next (second) pair, 5 in. 8 lines; dorsal (first) pair, 5 in. 8 lines; depth of fin between dorsal pair; 1 in. 8 lines; next pair, 1 in. 6 lines; next pair, 2 in.; next pair, 2 in. 7 lines; ventral pair, 2 lines. Width of head, 3 in. 6 lines; longitudinal diameter of eye, 2 in. Taking length of dorsal surface of mantle as 100: the proportional length from ventral edge is $\frac{8\,2}{1\,0\,0}$; width of fins at middle, $\frac{1\,3}{1\,0\,0}$; greatest width of body without fin, $\frac{5\,7}{1\,0\,0}$; length of suckered club of tentacular arms, $\frac{2\,2}{1\,0\,0}$; width of club, including outer fin, $\frac{1\,3}{1\,0\,0}$; longest sessile (fourth ventral) arm, $\frac{8\,4}{1\,0\,0}$; next (third) pair, $\frac{7\,0}{1\,0\,0}$; next (second) pair, $\frac{7\,1}{1\,0\,0}$; dorsal, $\frac{7\,1}{1\,0\,0}$. Another specimen gives length of ventral arms to dorsal length of mantle as $\frac{9\,8}{1\,0\,0}$ (suckered portion, $\frac{9\,0}{1\,0\,0}$); next pair, $\frac{7\,2}{1\,0\,0}$. *Internal Shell:* Elongate-ovate, semioval anteriorly, narrower posteriorly, with slight concavity of sides about one-third from posterior end; anterior two-thirds of midline of back nearly straight, posterior third with a gentle parabolic curve downwards to edge; spine thick, very short, curved downwards or towards ventral edge, not reaching beyond margin of shell; below spine a triangular space, twice as wide as deep, filled with irregular, lacunose, spiny projections of lamellæ, edges radiating from under base of spine; a middle space of upper surface rather more than one-third the width in front, rather less than one-eighth the width at one-fourth the length from posterior edge, convex; separated from lateral, slightly convex-shaped sides by two shallow, diverging impressions, disappearing at posterior fourth of length; middle of posterior fourth of length covered with coarse, irregular, short, vermicular, tubercular ridges, the sides with striæ arching forwards and outwards. Margins brown and horny at edge, calcareous further in, narrow in front and at sides of anterior half, becoming wider and forming steep sides posteriorly, united behind; a thick pad at posterior edge of hollow on ventral surface, the portion of which marked with transverse undulating lines of cellular growth is about four-sixths of total marginal length, flattened behind, slightly concave in middle, and convex at sides on front half; anterior two-sixths showing greatest convexity or depth of the shell at its posterior edge. Length from anterior to posterior edge, 5 in. 10 lines; greatest width (a little in front of middle), 2 in. 5 lines, or $\frac{4\,0}{1\,0\,0}$; greatest depth, 7 lines, or $\frac{1\,0\,\frac{1}{2}}{1\,0\,0}$; length of spine, $1\frac{1}{2}$ lines, or $\frac{2}{1\,0\,0}$; adult shell about 11 in. long, rather wider behind the lateral concavities, and without spine, which is often absent in much smaller specimens (probably old dwarfs). Sixteen sutural spaces in 6 lines near middle of underside of shell.

Reference.—Cat. Mol. B.M., Ceph. Ant. p. 103.

This is the largest and commonest species of *Sepia* on our coasts, and its internal dorsal shell or "Cuttle-fish Bone" is abundant on the shores everywhere in the Colony, although it has not been figured before. I think the character of the relative order of successive length of the sessile arms is not so satisfactory

as might be supposed from its frequent use by authors, owing to the fact that in this species the right and left of one pair sometimes vary 3 lines or more in examples as large as that figured (half the natural size); so that some measurements would show three pairs of arms equal in the present species. The nearest ally of this cuttle-fish is the *Sepia latimanus* (Quoy and Gaim.) (including the *Sepia Rappiana* of Feruss.) in size, general shape, form of club, and colour, but differs in the short blunt spine of shell and corresponding slight convexity of posterior middle part of body between the fins, which, in that species, is acuminate or projects in a long acute point, in accordance with the long acute spine of posterior end of the shell; the shell of *S. apama* is also proportionately wider than that of *S. latimanus*. The proportional greatest width to length from anterior to posterior margin is $\frac{29}{100}$ in D'Orbigny's figure, although said to be 31 in the text; it is sensibly narrower than the bone of *S. apama*, the proportional width of which is $\frac{40}{100}$.

Explanation of Figures.

Plate 188.—Fig. 1, internal bone or shell, dorsal view, of large specimen, two-thirds of natural size. Fig. 1*a*, ditto, viewed from ventral aspect. Fig. 1*b*, profile view. Fig. 1*c*, triangular space beneath posterior spine, magnified two diameters. Fig. 1*d*, posterior end, viewed from side, magnified two diameters. Fig. 1*e*, vermicular ridging of posterior portion of dorsal surface, magnified two diameters. Fig. 1*f*, portion of sutural lines of cell growth from ventral surface, magnified two diameters. Fig. 2, vertical section of smaller specimen, two-thirds the natural size, to show relation of cell growths to transverse sutural lines on middle and posterior portion of ventral surface. Fig. 2*a*, posterior end of ditto, magnified, showing the pad and form of obsolete decurved spine. Fig. 2*b*, portion of cell structure, more highly magnified, showing the parallelism of the layers (on the right hand), with the smooth, anterior, ventral surface, and their cutting that surface (on the left hand) to form the undulating, transverse, imbricating striæ of the middle and posterior portions of the ventral surface. Fig. 2*c*, portion of the same, magnified four diameters.

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Frederick McCoy.

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ROGICK

Natural History of Victoria.

PRODROMUS

OF THE

ZOOLOGY OF VICTORIA;

OR

FIGURES AND DESCRIPTIONS OF THE LIVING SPECIES OF ALL CLASSES

OF THE

VICTORIAN INDIGENOUS ANIMALS.

DECADE XX.

BY

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M DCCC XC.

ADVERTISEMENT.

It having been considered desirable to ascertain accurately the natural productions of the Colony of Victoria, and to publish works descriptive of them, on the plan of those issued by the Governments of the different States of America, investigations were undertaken, by order of the Victorian Government, to determine the Geology, Botany, and Zoology of the Colony, to form collections illustrative of each for the public use, and to make the necessary preparations for such systematic publications on the subject as might be useful and interesting to the general public, and contribute to the advancement of science.

As the geological and botanical investigations have already approached completion, and their publication is far advanced, it has been decided now to commence the publication of the third branch completing the subject, namely, that of the Zoology or indigenous members of the different classes of the animal kingdom.

The Fauna not being so well known as the Flora, it was a necessary preliminary to the publication to have a large number of drawings made, as opportunity arose, from the living or fresh examples of many species of reptiles, fish, and the lower animals, which lose their natural appearance shortly after death, and the true characters of many of which were consequently as yet unknown, as they had only been described from preserved specimens. A Prodromus, or preliminary issue, in the form of Decades, or numbers of ten plates, each with its complete descriptive letterpress, will be published, of such illustrations as are ready, without systematic order or waiting for the completion of any one branch. The many good observers in the country will thus have the means of accurately identifying various natural objects, their observations on which, if recorded and sent to the National Museum, where the originals of all the figures and descriptions are preserved, will be duly acknowledged, and will materially help in the preparation of the final systematic volume to be published for each class when it approaches completion.

Natural History of Victoria.

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M DCCC XC.

PREFACE.

This Twentieth Decade completes the Second Volume of the Prodromus of the Zoology of Victoria.

A systematic index is given of the contents of the first twenty Decades, comprising plates 1 to 200, combining the contents of the first and second volumes, according to which the plates with their corresponding letterpress may be bound in zoological order, all the illustrations of each class being put together by those who desire it. Those who prefer to bind the plates and corresponding letterpress in the order of their original appearance, and as the plates are consecutively numbered, can do so, bringing the prefaces together at the front. An alphabetical index is also given of the contents; the generic, specific, and popular names being included, as well as the synonyms, which latter are in italics.

I am greatly indebted to Mr. Simons for the high intelligence and painstaking accuracy with which he did me the favour to prepare these Indices—a task so onerous that I feel very grateful for his friendly help in relieving me of it—and with such care that they materially increase the value of these volumes.

The first plate in this Twentieth Decade represents two of the commonest of the beautiful small lizards constituting the genus *Hinulia*, with magnified details.

The second plate gives for the first time the colours of life of a lovely species of Dragonet, as similar fishes are called in England, not uncommon in Hobson's Bay, the *Callionymus calauropomus* (Rich.).

The third plate figures for the first time a beautiful kind of Red Gurnet-Perch, the *Neosebastes Scorpænoides* of Guichenot, not uncommon in the fish shops all the year round.

The fourth plate shows the details of a new little Fish, the *Trachinops caudimaculatus* (McCoy), sent to me by the Commissioner of Customs to determine whether it were, as the local fishermen assured him, the young of the Californian Salmon introduced by Sir Samuel Wilson!—So little are the native Fishes known for want of figures for reference.

The two following plates continue the illustrations of the valuable specimens and descriptions of the Polyzoa of our coast, given by Mr. MacGillivray.

The seventh plate shows the two sexes of one of the largest and most elegantly coloured of Victorian Moths, with its larva, pupa and cocoon to illustrate its metamorphoses.

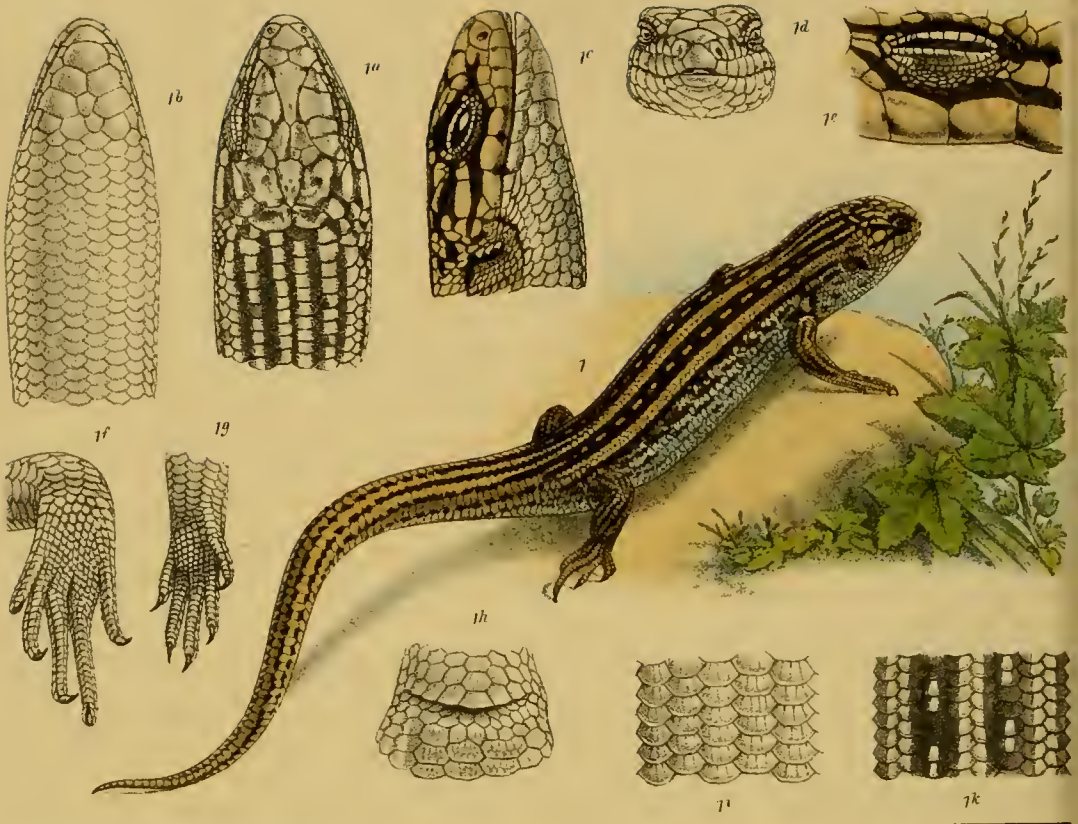
The eighth plate shows both sexes of the imago, with their larvæ and pupæ, of two species of butterfly of the genus *Pyrameis*, which have caused great alarm by appearing, for the two or three weeks of the end of September and beginning of October this year, in countless myriads over a great extent of country, forming heaps on the seashore for miles where drowned and washed in by the tide. (They were accompanied by such clouds of a Moth, *Agrotis spina*, that the houses were filled and the lights put out by their numbers, and walking was unpleasant from their multitudes in the air; and the ships for some miles out at sea were blackened with them.) One of these butterflies, the *Pyrameis Kershawi* (McCoy), has not been figured before, having been previously confounded with what was supposed to be the cosmopolitan *P. cardui*, or so-called Painted-lady Butterfly, quoted in most books of Physical Geography and Distribution of Animals as extending from England to Australia, but which it replaces here.

The ninth plate shows that curious Crab, the *Ibacus Peronii*.

And the tenth plate is in illustration of three species of our most abundant Starfishes, not figured of the colours of life before.

FREDERICK McCOY.

20th October, 1889.



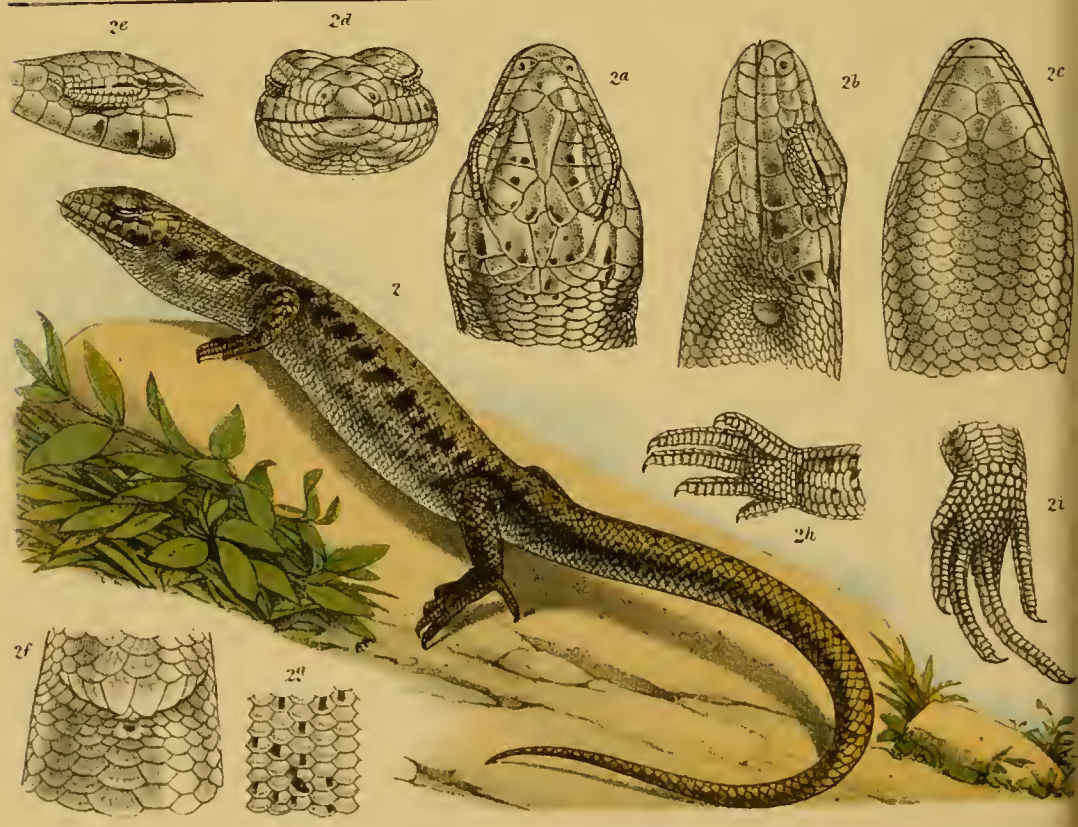


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PLATE 191, FIG. 1.

HINULIA WHITEI (LACÉP. SP.).

WHITE'S HINULIA LIZARD.

[Genus HINULIA (GRAY):<LYGOSOMA (DUM. and BIB.). (Sub-kingdom Vertebrata. Class Reptilia. Order Sauria. Sub-order Leptoglossæ. Tribe Geissosaura. Family Scincidæ.)

Gen. Char.—Body fusiform, tail rounded, tapering. Head subquadrate, obtusely pointed in front; rostral erect, triangular or hexagonal from truncation of the angles; nostril in middle of nasal plate, without posterior groove; no supranasal plates; frontal oblong, hexagonal; palate toothless, with deep triangular notch; fronto-parietal plates two, separate; lower eyelid covered with scales; ears small, lobed in front. Limbs moderate; five simple, compressed toes on each foot; heel of hind foot bordered with rows of conical granules. Scales smooth, thin; two middle preanal ones, usually larger than the adjoining ones.]

DESCRIPTION.—Profile of head flat from hind margin to hind edge of eye, thence abruptly arched to obtuse snout; no groove behind nostril, but a slight vertical groove from it to lower edge of nasal plate; rostral hexagonal, vertical apex touching prefrontal or internasal plate separating the nasals; prefrontal transversely rhombic, wider than long, about equalling rostral in length, touching first of a row of four frenal plates by each lateral angle; fronto-nasals hexagonal, slightly shorter than prefrontal, the two hinder edges of which they join, meeting in the middle, separating the prefrontal by half its length from the frontal; frontal quadrangular, obtuse-angled in front, tapering to a point behind, not twice as long as wide, a little longer than the fronto-parietals; parietals and interparietal of moderate size; four occipital plates, the inner pair larger than the outer one, on each side, behind the parietals; fifth and parts of fourth and sixth labials below eye; three large temporals; six supraoculars, third largest; eight to ten superciliary plates; four loreal plates. Ear-opening a little smaller than eye. Scales of side a little smaller than those of back and belly, forty round middle of body, smooth, those of belly with three faint longitudinal striæ; central preanal scales not perceptibly larger than the others. Limbs moderate, with slender toes, the hinder part of sole studded with blunt conical tubercles. *Colour*: Very pale yellowish-brown above and on underside of tail and legs; sides and belly bluish from side of head to base of tail; edges of eyelids and lobes on front edge of ear pure white; nape with five broad, black, and six whitish, longitudinal stripes; the middle black one disappears over the shoulder, letting the two next whitish stripes coalesce to form a broad, distinct, light stripe down middle of back; the two next black stripes on each side coalesce to form two broad, very conspicuous, longitudinal stripes, one on each side of midline of back, the intervening light streak on each side of nape continued as a row of round or kidney-shaped, light, very conspicuous spots in middle of broad black stripes (sometimes double, and sometimes breaking into a short row of two or three small spots); the black bands of the back are continued on the tail as rows of irregular black spots, first seven, then, about halfway, three, and disappearing towards end of tail; a broad, distinct, whitish band, like median dorsal one, on each side bounding the black one; and outside this on each side the marking is very variable, always a bluish-grey ground, with black markings either irregular marbling or defining one or two rows of rounded light spots; chin, lips, and cheeks whitish with a few irregular, longitudinal dark markings on cheek, lips, and temple, and occasional

spots and dark edges to head plates; upper side of limbs with interrupted dark longitudinal dashes, or occasionally with round light spots irregularly edged with dark. *Measurements* of rather small specimen figured:—Total length, 6 inches; tail, 3 in. 3 lines; length of head, 6½ lines; width of head, 5 lines; width of middle of body, 5 lines; tip of snout to axil of fore limb, 1 inch; axil to front base of hind limb, 1 in. 5 lines; length of fore limb to tip of longest finger, 8 lines; length of hind limb to tip of longest toe,.11½ lines; diameter of orbit, 1½ lines.

Reference.—=*Scincus Whitii*, Lacépede, An. Mus., v. 4, p. 192; Quoy and Gaim, Uranie, t. 42, f. 2;=*Hinulia id.*, Gray Zool. E. and T. Rept.;=*Tiliqua leucopsis*, Gray An. N. H. 1838, p. 291;=*Lygosoma molinigera*, Dum. and Bib. Erpt., v. 5, p. 736.

This is one of the most elegantly marked, but most variable of the small Lizards common in Victoria. The two white spotted broad, black, longitudinal stripes on the back are the most constant of the markings, but the markings of the sides vary greatly, sometimes presenting two or three rows of round whitish spots, margined irregularly with black; more commonly the sides show only a number of black spots of very irregular size and shape. I have seen one specimen with four irregular rows of white, black-edged spots on each side of the dorsal pair, and extending faintly on to the throat. The two pairs of occipital or nuchal plates are sometimes united into one pair, occupying the same space.

This Lizard, like other species of *Hinulia*, does not climb trees or bushes like the so-called Bloodsucker (*Grammatophora*), but keeps on the ground under logs and stones, darting rapidly through the herbage when disturbed.

The specimen figured is rather less than the average size. From Prahran, near Melbourne. It occasionally reaches a length of 1 ft. 2 in.

Explanation of Figures.

Plate 191.—Fig. 1, rather small specimen, natural size. Fig. 1*a*, top of head, to show form of cephalic plates, magnified two diameters (fronto-parietals irregularly divided into two on one side and three on the other). Fig. 1*b*, underside, to show chin plates and abdominal scales, magnified two diameters. Fig. 1*c*, side view of head to cardrum, magnified two diameters. Fig. 1*d*, front view of head, showing form of rostral and adjacent plates. Fig. 1*e*, eye, magnified four diameters, showing scaly lower eyelid and superciliary plates. Fig 1*f*, underside of hind foot, to show conical tubercles of sole or palm, magnified two diameters. Fig. 1*g*, underside of anterior foot, showing tubercles of sole or palm, magnified two diameters. Fig. 1*h*, preanal scales, magnified two diameters. Fig. 1*i*, abdominal scales, to show faint striæ, magnified two diameters. Fig. 1*k*, portion of back, to show distribution of colouring on median light stripe, and two broad dark ones, magnified two diameters.

PLATE 191, FIG. 2.

HINULIA QUOYI (DUM. AND BIB.).

QUOY'S HINULIA LIZARD.

DESCRIPTION.—Moderately slender; back broad, flattened; head broad, triangular, obtusely pointed; tail compressed in middle portion, rounded above and below. *Head plates:* Nostril near lower edge of nasal, with slight indication of vertical sulcus, not meeting above; rostral hexagonal, moderate, curved round obtusely rounded tip of snout, joining prefrontal or internasal by moderately broad suture, separating nasals; prefrontal broader than long, scarcely touching anterior acute angle of frontal; frenonasals just touching by points of inner angles, or nearly so; frontal quadrangular, acute-angled in front, posterior end very acute-angled, long, narrow to hind apex, lateral sides touching the first, second, and part of third supraoculars, as long as fronto-parietals and interparietal taken together; fourth supraoculars large, with a very small fifth posterior one; nine supraciliaries, the sixth and seventh largest; three large temporal plates on each outer side of parietals; a row of three pairs of nuchal or occipital plates, longer than wide, inner pair largest; parietals very large, sometimes touching behind end of interparietal; seven upper labials, sixth and seventh largest, fifth and sixth under the eye; five loreals; ear-opening nearly as large as eye, with very slight indication of four lobules within anterior edge, smaller than adjacent scales. Legs rather long; longest hind toe, if drawn up to side of body and fore leg drawn down, reaches to wrist of fore leg; from tip of snout to shoulder about once and a half in space from axil of arm to groin on front edge of hind limbs. Tail about twice as long as head and body (too short, from re-growth, in specimen figured). *Scales:* Forty round middle of body, ventral scales smooth and slightly larger than the dorsal ones, which are very faintly marked with three or five longitudinal striæ; scales of sides much smaller than those of upper or undersides. Three pairs of large preanal scales, longer than wide, middle much largest. Toes compressed, subdigital plates divided by longitudinal grooves, twenty-four under longest or fourth toe. *Colour:* Pale greenish olive-brown on upper surface; underside and end of tail yellowish-white; sides pale greyish-blue; a broad band along each side at turn of back of irregular, vertical, broad, dark-brown streaks, with zig-zag edges and irregularly connected; upper side of limbs with numerous, irregular, transverse, zig-zag, dark-brown markings; middle of back, top of head, and sides of tail with a few small, quadrate, dark-brown specks; sometimes a few dark specks on throat and belly, occasionally but rarely forming lines of dark spots from throat to preanal scales. *Measurements:* Length of head, 8 lines; width of head, 6 lines; length of head and body from tip of snout to end of preanal scales, 2 in. 8 lines; width of middle of body, 6 lines; length of anterior limb, 8 lines; length of posterior limb, 1 in. 1 line.

REFERENCES.—=*Lygosoma Quoyi*, Dum. and Bib., Erpt. v. 5, p. 728; =*Hinulia gastrosticta*, Günther, Ereb. and Ter. Rept., p. 11; Quoy and Gaim., Voy. Urainie, Zool., t. 42, fig. 1.

This is a much broader Lizard, with wider back, than the *H. tenuis* or *H. elegans*, and has more numerous rows of scales round the middle of the body.

It has the same habits as the *Hinulia Whitei*, running rapidly through the scanty herbage, and hiding under logs and stones. The specimen figured is from the Dandenong Ranges, near Melbourne; common near Sunbury.

Explanation of Figures.

Plate 191.—Fig. 2, rather small specimen, natural size (tail re-grown, shorter than proper length). Fig. 2*a*, top of head, magnified two diameters. Fig. 2*b*, side view of head and neck, showing plates and slight trace of anterior lobules inside anterior edge of ear. Fig. 2*c*, throat, magnified two diameters, showing large gular plates. Fig. 2*d*, front view of head, magnified two diameters. Fig. 2*e*, eye, magnified four diameters, showing supra-oculars, superciliaries, scaly lower eyelid, and upper labials, in relation to eye. Fig. 2*f*, preanal scales and abdominal and subcaudal scales, magnified two diameters. Fig. 2*g*, dorsal scales, magnified two diameters. Fig. 2*h*, lower side of fore foot, magnified two diameters. Fig. 2*i*, lower side of hind foot, magnified two diameters, to show granules on sole and subdigital scales.

Frederick McCoy.

A Bartholomew, del & lith.

Prof. M.Coy, direct.

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PLATE 192.

CALLIONYMUS CALAUROPOMUS (RICH.).

THE CROOK-SPINED DRAGONET.

[Genus CALLIONYMUS (LIN.). (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygii. Family Gobiidæ.)

Gen. Char.—Head trigonal, depressed, cleft of mouth narrow, nearly horizontal, upper jaw very protractile; eyes moderate, high on sides of head, directed outwards and upwards; teeth small, forming villiform patches on premaxillarics and lower jaws, none on palate nor vomer; a very large cylindrical spine extending from angle of preoperculum. Anterior part of body depressed, middle and hinder part usually moderately compressed. Skin smooth, without conspicuous scales. Dorsal fins two, anterior small, with three or four flexible spines. Ventrals large, very wide apart, of one spine and five many-branched rays. Gill-opening very small, usually reduced to an oval hole at upper edge of operculum. Branchiostegals six. No air-bladder. Pseudobranchiæ. A slit behind fourth gill.]

D. 4 + 8; A. 7; C. 10; P. 20; V. 1 + 5. L.l. 232.

DESCRIPTION.—Head broad, trigonal, compressed in front of the eye, with the profile very tumid and arching rapidly from middle of eye to edge of upper lip, the cleft of the mouth being horizontal when closed, but directed forwards and downwards when protruded. Orbits ovate, longer than wide, wider behind than in front, and deeply notching the forehead; the space between the eyes half the longitudinal diameter of orbit. Cheeks behind and below the eyes very tumid, arching outwards abruptly from the compressed rostral portion, and extending with lower edge of preoperculum into the very long preopercular spine, which is bifid at the rounded posterior end; the posterior spine directed upwards, the other hooked forwards and upwards. Operculum depressed, with a narrow, rounded posterior lobe, above which is the large, oval, branchial opening, about half the vertical diameter of the eye in length. Body broader than deep; sides very tumid but arching on upper side downwards into a deep wide sulcus, in which the dorsal fin is placed, and similarly arching on under side upwards into a wide, deep channel, in which the anal fin is lodged. A longitudinal narrow depression along the middle of sides. Wide space between pectorals and ventrals flat. First dorsal of four spines; the first about one-third longer than the second; second and third nearly equal; fourth a little shorter than the third; first branched ray one-third longer than the first spinous ray. Pectoral rhombic, obtusely pointed a little below middle, where the rays are longest. Caudal large, ovate, with the four middle rays prolonged to double the length of the others; the two branches of each uniting beyond the membrane into a single filament. In the young males figured these four rays are shorter, according to age, and in the female their branches are not united into prolonged filaments, but the posterior edge of the caudal fin is broadly rounded. *Teeth:* Minute, sharp-pointed, in several rows on jaws. Lateral line crossing the nape a little in front of the gill-openings, round which on each side it curves downwards abruptly to about level of middle of gill-opening; thence arches with slight, irregular undulations to the hollow midline of sides under about the eighth branched ray of dorsal; and bifurcating at the base of caudal fin, one branch running along the fifth and another along the sixth ray. *Skin:* Naked, glossy,

without scales, conical papilla in front of anal opening large. *Colour:* Male: Back and snout pale greenish-brown, faintly mottled with pale pink; sides of head pale purplish-carmine, with narrow branching lines of yellow; sides of body from lateral line paler carmine than sides of head, with a few longitudinal narrow yellow lines; a dark-purplish blotch at base of pectoral. Pectoral with nearly colourless membrane, yellowish above, and upper rays yellow and reddish-purple, spotted. First dorsal with orange-red rays and two large dark-purple blotches on membrane behind second and third rays; membrane behind first ray yellowish-orange. Second dorsal with rays and membrane clouded irregularly with greenish-yellow and purple, and, near the edge, with peach-blossom pink, and yellow longitudinal lines. Caudal with upper rays brown; membrane pale greenish-yellow with definite, narrow, longitudinal lines of bright peach-blossom colour; lower one or two rays and membrane dark purplish-slate colour; a few oval spots of opaline bluish-purple at base of tail. Pectoral fin with posterior rays and membrane variegated with pinkish-purple and yellow, the purple becoming dark purplish-slate colour near edge and on front two rays and membrane. Anal pale purplish slate grey. Underside of body pale purplish-white. Iris greenish-bronze. Female: dull bronzy-brown above, passing into whitish on belly, throat, and lower part of cheeks, the white and brown joining by an irregular mottling or network of the dark colour enclosing spaces of the lighter along the sides of body and cheeks. First dorsal usually purplish, with a few pale pink spots on the rays. Ventrals pale brown, with purplish membranes towards margin. Pectorals nearly colourless, with brownish rays. Second dorsal and anal irregularly clouded with blackish-purple; the rays and membrane otherwise yellowish. Caudal brownish, with lighter rays, and a dark blackish-purple patch formed by the membranes of the three lower spaces. *Measurements:* Length of rather large specimen from tip of snout to base of caudal, 8 in. 3 lines. Proportional measurements to this, as 100: Tip of snout to anterior edge of orbit, $\frac{11}{100}$; to posterior edge of orbit, $\frac{18}{100}$; to tip of preopercular spine, $\frac{31}{100}$; to posterior lobed edge of operculum, $\frac{33}{100}$; to anterior edge of gill-opening, $\frac{29}{100}$; to base of pectoral, $\frac{36}{100}$; to base of ventral, $\frac{25}{100}$; to first spine of dorsal, $\frac{30}{100}$; to first dorsal branched ray, $\frac{46}{100}$; to last ray of dorsal, $\frac{70}{100}$; to first ray of anal, $\frac{48}{100}$; length of middle elongate rays of caudal, $\frac{60}{100}$; lateral rays of caudal, $\frac{24}{100}$; longest pectoral ray, $\frac{20}{100}$; longest ventral ray, $\frac{28}{100}$; first spine of dorsal, $\frac{12}{100}$; first branched ray of dorsal, $\frac{20}{100}$; greatest width of head at base of preopercular spine, $\frac{23}{100}$; depth of head at same point, $\frac{25}{100}$; depth of body about middle of length, under sixth branched ray of dorsal, $\frac{12}{100}$; thickness, $\frac{16}{100}$.

Reference.—Er. and Ter., Fish, t. 7, f. 4 and 5, p. 10.

This extremely beautiful species of *Callionymus*, or Dragonet, as such fishes are called in England, is very variable in the brilliant colouring of the male; the dull-coloured female being more uniform and devoid of the brilliant tints of the male. The female is easily distinguished by the dullness of the colouring and the simple rounded posterior edge of the caudal fin, wanting the extreme elongation of the fourth, fifth, sixth, and seventh rays, which in the old males are so conspicuous by the union of the branches into simple extended filaments. The anal papilla is very short and inconspicuous in the female. The elongation of the

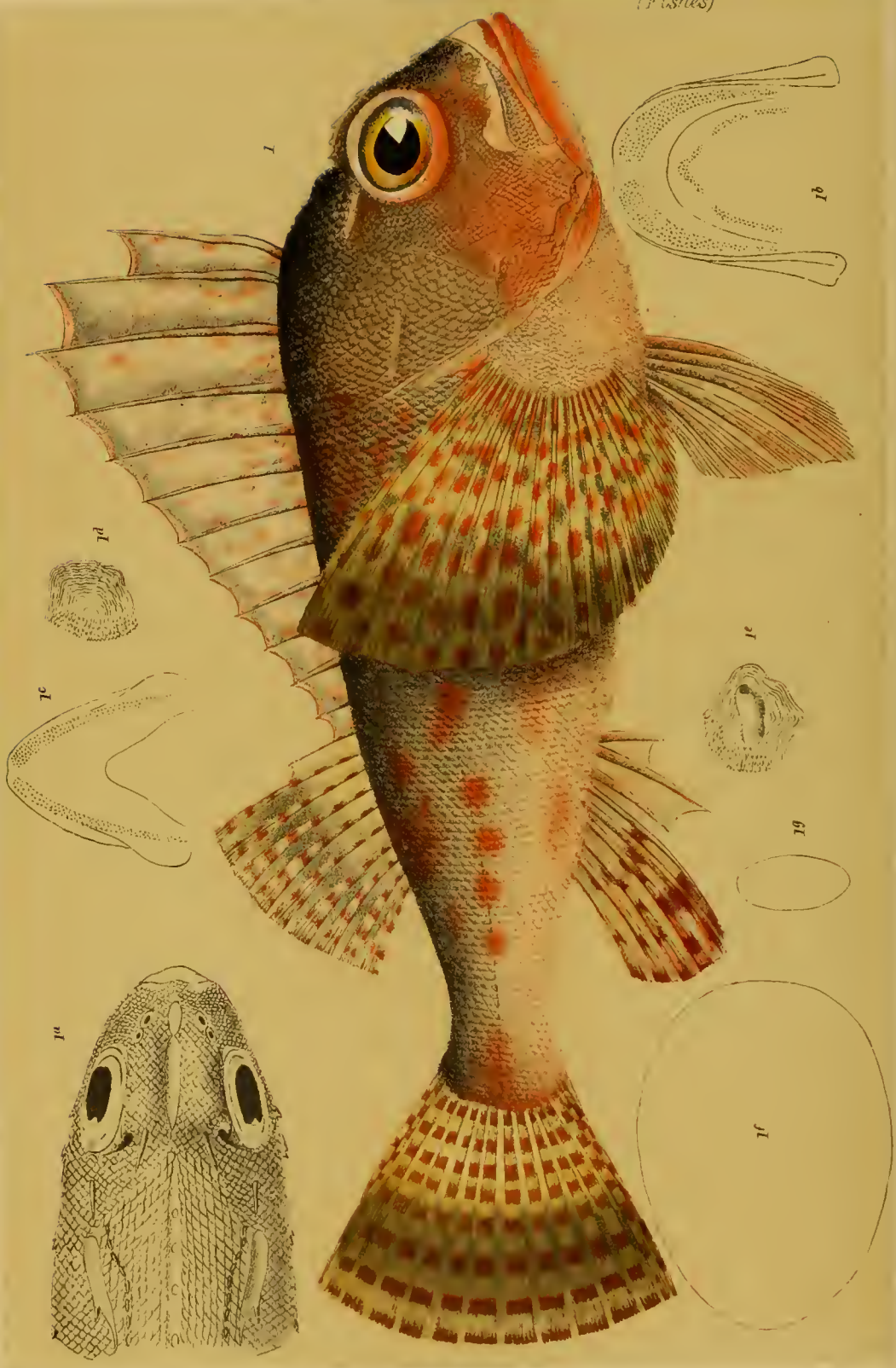
anterior dorsal spines is not a marked sexual distinction in this species, and I feel sure that Dr. Günther's suggestion that this species may be the female of *C. altevelis* (Schlegel), of Japan, is not correct. Our two figures are of immature males, intermediate in elongation of the middle caudal rays between the adult male described and the female. Not very uncommon in Hobson's Bay. Not figured of the colours of life before.

Explanation of Figures.

Plate 192.—Fig. 1, young male, two-thirds natural size. Fig. 1*a*, lower jaw and teeth, twice the natural size. Fig. 1*b*, upper jaw and teeth, twice the natural size. Fig. 1*c*, section of body in front of ventrals. Fig. 1*d*, section of body behind dorsal. Fig. 1*e*, section of end of pedicle of tail. Fig. 2, younger male.

Frederick McCoy.

ZOOLOGY OF VICTORIA
(Fishes)



A. Burthalomew del. & lith.

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PLATE 193.

NEOSEBASTES SCORPÆNOIDES (GUICH.).

THE SPOTTED RED GURNET-PERCH.

[Genus NEOSEBASTES (GUICHENOT). (Sub-kingdom Vetebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygii. Family Scorpænidæ.)

Gen. Char.—Resembling *Sebastes*, but no scales on vertical fins, and having lower rays of pectoral branched and not elongated. Head large, spinous, and tuberculated, but less so than in *Scorpæna;* head and body entirely covered with rough scales; no fleshy filaments from head. One dorsal; seven branchiostegal rays. Teeth in villiform bands on jaw, vomer, and palatines.]

D. 13 + 8*; A. 3 + 5; V. 1 + 5; P. 22; C. $15\frac{1}{6}$. L.l. $48\frac{8}{34}$ under third dorsal spine; $\frac{9}{25}$ about middle of body under eighth dorsal spine.

DESCRIPTION.—*Form:* Ovate, moderately elongate and compressed, profile of head sloping rapidly from second spine of dorsal (corresponding to the greatest depth) to snout, broken by the projection of nearly one-third the diameter of the very large oval eye; the ocular projections slope to a very deep, smooth channel between the eyes. Gape slightly oblique; lower jaw slightly projecting in front of upper when mouth closed, with a conspicuous knob under its symphysis, and a large rounded pore on each side. Nostrils large; a strong spine near inner margin of anterior one. Superciliary ridge with three, gradually increasing, compressed spines, the posterior one largest. A slight, transverse, smooth furrow behind the eyes. One long, ridge-like, compressed spine, increasing in height to posterior end on each side of nape, beginning in line with posterior edge of orbit; a similar spine, compressed, ridge-like, with two posterior points on stay from edge of orbit to edge of preoperculum; two similar, compressed, spinous ridges in one line, each with two compressed spinous points, near posterior end, extending from anterior fourth of orbit longitudinally nearly to edge of preoperculum on suborbital; one-fifth the diameter of the orbit below its edge. Preoperculum extending in a large compressed spine, continuing its angle near to edge of operculum a little above base of pectoral; a smaller sharp spine below; and three broad, triangular, lobe-like spines at equidistant intervals extended to its lower edge. Operculum with a strong, ridged spine extending upwards and backwards along upper arched edge; a second, longer, ridged spine in a line from middle of eye, directed backwards, nearly reaching edge of operculum. The lachrymal bone or preorbital at lower edge has a broad, trisulcate, three-pointed spine in front overlapping the intermaxillary bone, and four sharp, conical spines behind directed downwards and backwards at upper edge of maxillary. Greatest depth between second and third spines of dorsal, equal to about one-third the length of the body without the caudal fin; thickness of the body about two-thirds the depth; length of the head about two and two-thirds in total length, excluding caudal fin; length of head about one-sixth more than the depth of the body; profile of back sloping with slight convexity to end of dorsal, moderately constricted thence to caudal fin; ventral profile more convex to origin of anal,

* It is, no doubt, by slip of the pen that M. Guichenot puts 18 as the number of soft rays in the dorsal.

thence tapering in nearly straight line to base of caudal fin. Orbit very large, a little less than one-third the length of the head, and slightly less than its own diameter from tip of snout; space between middle of orbits less than the diameter of orbit. Upper edge of dorsal moderately arched for the first five spines, sloping straightly thence to the twelfth; thirteenth on front part of branched rays, double the length of the twelfth, half the length of the following branched ray; first spine of dorsal slightly sigmoid, two-thirds the length of the second, the third being longest. *Pectoral:* Upper rays longest, reaching to base of anal; lower rays branched, the lowest one nearly or quite simple, border of fin convex posteriorly, base under third dorsal spine. *Scales:* Moderate, rounded, covering the whole of the head (except the interorbital groove and a small similar one in front of dorsal and transverse sulcus behind eyes) to tip of snout, very rough to the touch, strongly ctenoid on posterior, semicircular margin, and covered with minute, spinulose granules. Lateral line arched and one-eighth of depth from dorsal edge from origin to about under eighth dorsal spine, thence nearly straight to middle of caudal; about one-fourth the depth from dorsal edge about middle of body. Total length from tip of snout to end of caudal fin of large specimen, 10 in. 6 lines. Proportional measurements to this, as 100: Tip of snout to front edge of orbit, $\frac{7}{100}$; diameter of orbit, $\frac{8}{100}$; to end of maxillary, $\frac{12}{100}$; to end of preopercular spine, $\frac{24}{100}$; to posterior edge of operculum, $\frac{30}{100}$; to upper base of pectoral, $\frac{26}{100}$; to base of first dorsal spine, $\frac{25}{100}$; to base of first branched dorsal spine, $\frac{58}{100}$; to first anal spine, $\frac{54}{100}$; length of second branched ray of dorsal, $\frac{15}{100}$; depth of body, $\frac{27}{100}$; thickness, $\frac{20}{100}$; length of first dorsal spine, $\frac{11}{100}$; of second, $\frac{13}{100}$; of third, $\frac{23}{100}$; length of pectoral, $\frac{26}{100}$; length of caudal fin, $\frac{29}{100}$; first anal spine, $\frac{7}{100}$; second anal spine, $\frac{11}{100}$; third anal spine, $\frac{10}{100}$; second branched ray, $\frac{19}{100}$. Six scales in six lines at middle of body. *Colour:* Upper part of back and head rich purplish, fading into white on lower edge of belly, with several obscure, longitudinal rows of large, roundish, indefinite, rosy-red spots. Cheeks and lower part of head bright red; pectorals greenish in some, yellowish in others, with a dark, purplish posterior margin. Six or seven concentric rows of red spots on rays with occasionally darker spots between them on membranes. Ventrals with rays red, membrane very pale purplish. Spinous portion of dorsal with the membrane obliquely streaked with pale purplish and obscure, scattered, irregular cloudy spots; branched portion of dorsal with greenish membrane and five or six transverse rows of red spots on rays. Caudal fin with basal half yellowish on membrane, but distal half dark purplish, with a narrow, lighter, posterior edge, the rays transversely banded with six or seven rows of dull red spots. Anal with nearly colourless, purplish membrane and irregular spots on the reddish rays. Iris yellow, with red imperfect circles.

Reference.—Guichenot, Mem. de la Soc. Impér. des Sc. Nat. de Cherbourg, v. 13 (2nd ser., v. 3), p. 83.

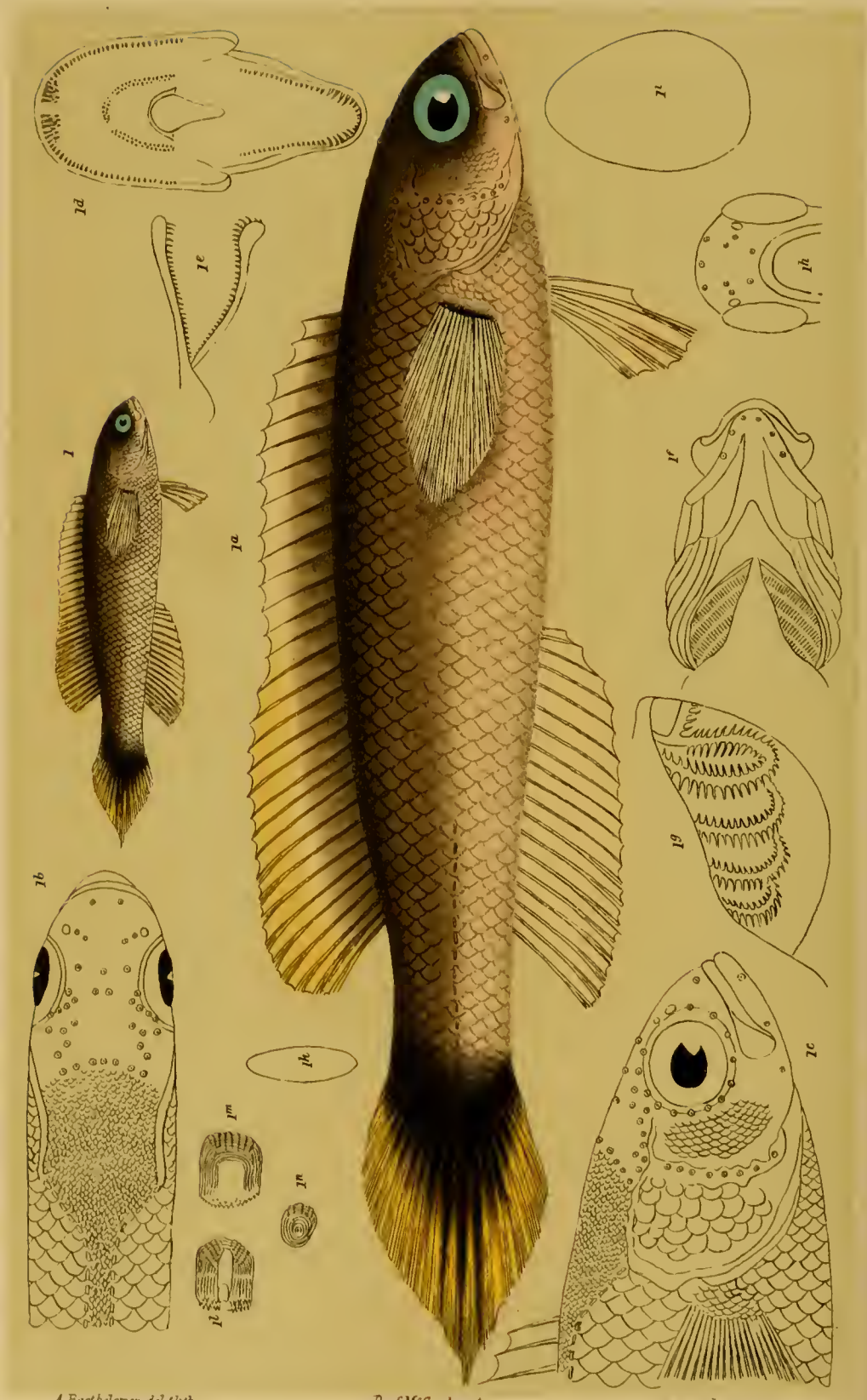
This very common fish in the Melbourne markets in winter is confounded by fishermen and dealers with the Banded Red Gurnet-Perch *(Sebastes percoides)*—(figured on our plate 33, of the Fourth Decade)—under the name of Red Gurnet. It is easily distinguished by wanting the vertical or transverse dark bands, and even generically by the lower rays of the pectoral fins being branched like the others, while in the *Sebastes* several of the lower rays are unbranched and extended beyond the membrane.

Now figured for the first time, although so abundant on our coasts and in the markets.

Explanation of Figures.

Plate 193.—Fig. 1, average specimen, about two-thirds natural size. Fig. 1*a*, upper view of head, about two-thirds the natural size. Fig. 1*b*, teeth of upper jaw, vomer, and palate, natural size. Fig. 1*c*, teeth of lower jaw, natural size. Fig. 1*d*, scale above lateral line, magnified three diameters. Fig. 1*e*, scale of lateral line, magnified three diameters. Fig. 1*f*, section at base of pectoral. Fig. 1*g*, section of pedicle of tail.

Frederick McCoy.


1d
1e
1i
1h
1
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1c

PLATE 194.

TRACHINOPS CAUDIMACULATUS (McCOY).

THE BLOTCH-TAILED TRACHINOPS.

[Genus TRACHINOPS (GÜNTH.). (Sub-kingdom Vertebrata. Class Pisces. Sub-class Teleostea. Order Acanthopterygii. Family Nandidæ. Sub-family Plesiopina.)

Gen. Char.—Body oblong, moderately compressed; mouth obtusely rounded, not protractile; none of the plates of the head serrated. Teeth on jaws, vomer, and palatine bones. Tongue smooth; scales of moderate size, rounded, ctenoid at margin,* lateral line interrupted near end of dorsal fin. Dorsal and anal fins long; fourteen spines in dorsal, three in anal; ventral fins thoracic, with one spine and four branched rays, not elongate; caudal fin pointed, with the middle rays prolonged in filaments. Five branchiostegals; gills three and a half; pseudobranchiæ; gill-membrane not united below the throat; pyloric appendages few. Australia.]

D. 14 + 17; A. 3 + 16; P. 16; V. 1 + 4; C. 24; L.l. 45 + 12.

DESCRIPTION.—Oblong, narrow, moderately compressed; length of head slightly greater than the depth of the body, and slightly more than four times in total length, excluding caudal fin; the depth of the body diminishes little till beyond the dorsal and anal fins, greatest depth near end of pectoral fin about one-fifth of total length, excluding caudal; interorbital space convex, smooth, without scales, less than diameter of orbit, with a few rows of large, prominent pores; snout obtuse, about one-half diameter of orbit; cleft of mouth wide, oblique; maxillary extending a little beyond middle of eye; lower jaw slightly longer than upper one. Teeth small, pointed along the jaws, three or four larger than the rest on each side near the front; two rows forming a long patch on each palate bone, and two rows forming a short, transverse, arched patch on the vomer, nearly joining ends of palatine patches. Gill-openings wide. Scales on cheeks and operculum moderate, those on nape between anterior ends of lateral lines and over lateral line at base of dorsal very small. Lateral line is in two disconnected portions, one of forty-five tubular scales, rising from head to close below dorsal, extending to the thirty-fifth row of scales, where that fin ends; the posterior portion of twelve similar scales occupies the middle of the sides of the tail on the twelve posterior rows of scales; three rows of scales having both the overlapping portions of the interrupted lateral line. Scales of body of moderate size, rounded, finely serrated at posterior edge; along lateral line about forty-seven, two small scales above and seventeen large below it at vertical of base of pectoral. *Fins:* Pectoral fin of sixteen branched rays, oval, about one-fifth shorter than head. Ventral of one spine and four branched rays, about one-fifth shorter than the pectoral, a little in front of which it arises. Dorsal of fourteen spines and seventeen jointed rays, low to end of spinous portion, then higher to near the end which is rounded by a shortening of the three last rays; greatest depth of soft dorsal a little less than depth of body at base; spinous portion rather less than half the depth of body at base. Anal fin of three spines and sixteen soft rays, not so deep as soft dorsal. Caudal of twenty-four rays, angularly pointed behind, the three middle rays extending as filaments one-quarter longer than the rest of the fin. *Colour:* Back dark-brown, becoming lighter and purplish on sides; scales minutely dotted with black; a large, blackish blotch at base of tail, from which five or six middle rays

* See remarks further on.

carry the blackish colour through the middle of the fin to the two extended filaments; the rest of the fin and the soft dorsal pale orange; anterior part of dorsal, anal, pectoral, and ventral, as well as throat and belly, whitish; iris silver bluish-white. Length from snout to base of caudal (excluding fin) 2 in. 1 line; proportional length of head, $\frac{26}{100}$; length of snout, $\frac{5}{100}$; diameter of orbit, $\frac{9}{100}$; interorbital space, $\frac{8}{100}$; length of pectoral, $\frac{20}{100}$; ventrals, $\frac{18}{100}$; snout to origin of dorsal, $\frac{28}{100}$; to end of dorsal, $\frac{85}{100}$; length of caudal, without filaments, $\frac{25}{100}$; filaments, $\frac{9}{100}$; greatest depth of body about middle, $\frac{20}{100}$; depth of tail, $\frac{12}{100}$; thickness of middle of body, $\frac{9}{100}$.

This little fish created a great sensation by appearing in large numbers about the middle of October, 1884, at the piers at Williamstown, in Hobson's Bay, and, being reported to the Commissioner of Customs as the young of the Californian Salmon, were sent to me as an important matter to be determined. Even the Acanthopterygious character of the dorsal fin, one might have supposed, would have prevented any one acquainted with fish from confounding this with any sort of Salmon. The Inspectors of Fisheries and others dealing officially with the fishes of our waters are greatly retarded in their business for want of recognisable figures of most of the native sorts, many of which, like the present species, have never been figured. The illustrations of the natural colours of the living fishes which I expect to present in these Decades will, I hope, diminish the difficulty of recognising them in future, and enable observations on habits, migrations, and times and places of breeding of the different sorts to be attributed correctly to the definitely-named and classified species.

This is the second species of *Trachinops* known, and is easily distinguished from the Sydney *T. tæniatus* (Günth.) by the darkness of the back, without the light longitudinal band of that species; which also has much more prolonged central filaments of the caudal fin, a much lower dorsal fin, and more numerous scales along the lateral line than in the present one. The lateral line rises from the upper end of the gill-opening to the anterior end of the dorsal; the triangular space on nape between these deflected ends of the two lateral lines being covered with very much smaller scales than those of the body; the lateral line, of strongly keeled tubular scales, runs along the base of the dorsal fin, separated from it by two rows only of the minute scales such as are above their anterior ends on the nape.

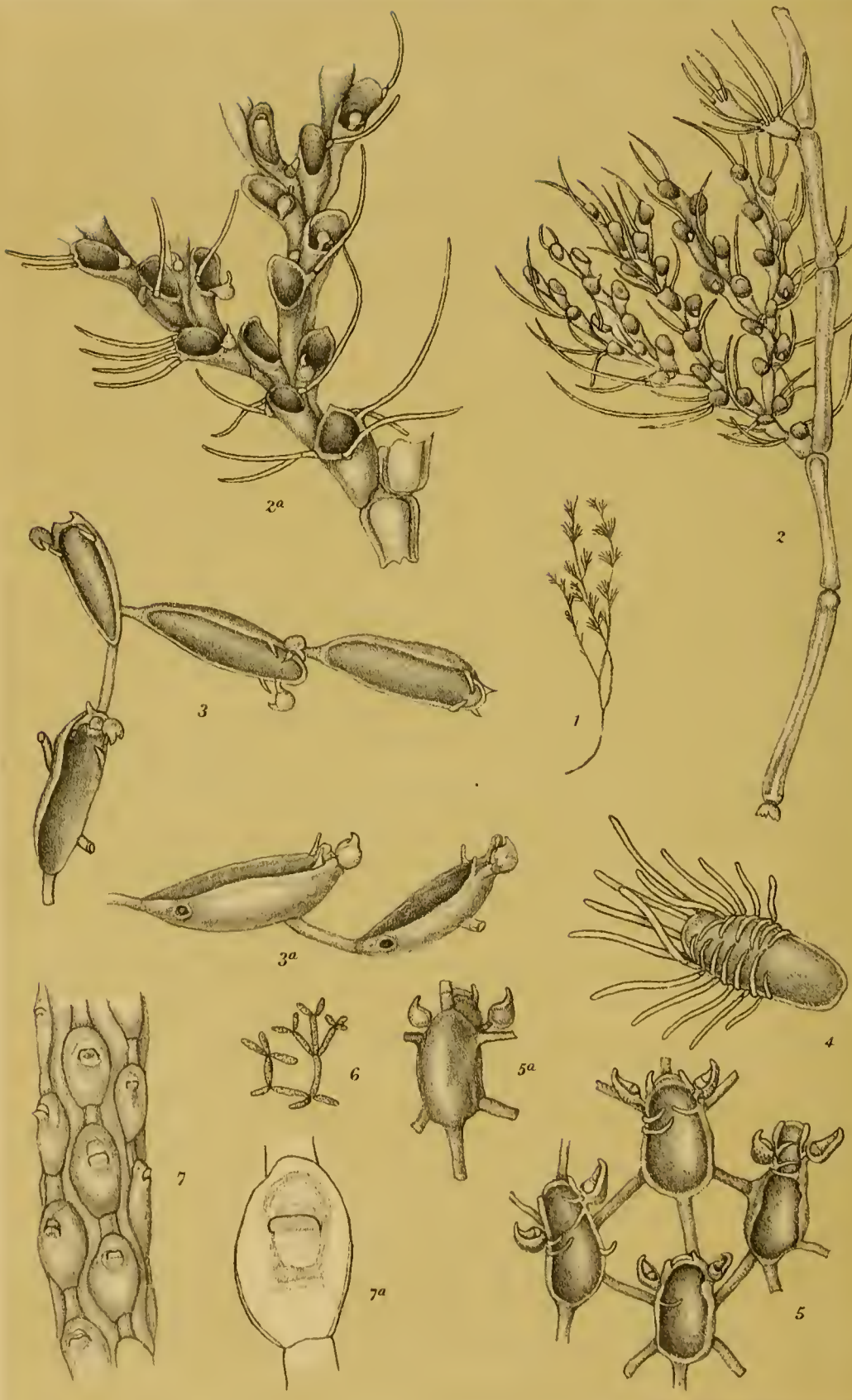
Dr. Günther in establishing the genus *Trachinops* for the Sydney *T. tæniatus* gives "scales cycloid" as one of the generic characters; but Prof. Kner describing the same species (Reise der Novara Zool., Theil, Fische, p. 216) says, "Die Schuppen sind von mässiger Grösse, weich, und am ganzen Vorderrumpfe glattrandig, gegen den Schwanz aber zeigen sie den Bau ctenoider Schuppen, am festsitzenden Ende einen Fächer von 10–12 Radien und gegen das freie Ende concentrische Furchen und ein feines Netz mit sich bildenden Kurtzen Spitzen in mehreren Reihen, die am freien Rande zu längern wimpern-ähnlich Zähnchen werden," and these remarks apply so well, as far as the hinder portion of the body goes, that I have altered the generic character for both species to "scales ctenoid." In the present species, I think all the large scales are ctenoid.

Found occasionally in abundance about the piers in Hobson's Bay. Not figured before.

Explanation of Figure.

Plate 194.—Fig. 1, side view, natural size, of adult specimen, of the natural colours. Fig. 1*a*, same, magnified three diameters (upper part of lateral line at base of dorsal somewhat obscured by the shading). Fig. 1*b*, top of head, magnified four diameters, to show scaleless interorbital portion, with large pores, and small scales on nape, and midline of back between ends of anterior portions of lateral line. Fig. 1*c*, side view of head, magnified four diameters, showing the relations of scales, pores, and origin of lateral line. Fig. 1*d*, teeth of upper and lower jaws, vomer and palatine bones, and smooth tongue, magnified six diameters. Fig. 1*e*, side view of teeth of jaws, showing the increased size of some of them near the anterior end, magnified six diameters. Fig. 1*f*, isthmus, lower jaws, gill-rays, and pseudobranchiæ, magnified three diameters. Fig. 1*g*, portion of gills, side view, magnified seven diameters. Fig. 1*h*, front view of head, showing convexity of interorbital space, magnified four diameters. Fig. 1*i*, section of body behind base of pectorals, magnified three diameters. Fig. 1*k*, section of pedicle of tail, magnified three diameters. Fig. 1*l*, scale from upper lateral line, magnified six diameters. Fig. 1*m*, scale from middle of body, magnified six diameters. Fig. 1*n*, scale from nape of neck, magnified six diameters.

Frederick McCoy.



P. h. Macgillivray, del.
J. Ripper, lith.

Prof. McCoy dirext

Steam litho. Gov.t Printing Office

PLATE 195, FIGS. 1 AND 2.

STIRPARIA GLABRA (HINCKS).

[Genus STIRPARIA (GOLDSTEIN). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Bicellariidæ.)

Gen. Char.—Zoarium consisting of tufts of celliferous branches attached to annulated or segmented, articulated stems. Zoœcia biserial, turbinate; aperture opening upwards and forwards, and furnished with marginal or sub-marginal spines.]

DESCRIPTION.—Zoarium erect, branched, branches calcareous, divided into usually alternately longer and shorter internodes, distinctly articulated together. Zoœcia in flabellately branched clusters, articulated to one side of the upper extremity of an internode, commencing by a turbinate zoœcium from which two others arise, giving origin to dichotomously dividing branches; zoœcia alternate, in two continuous series, united side to side, narrowed below and expanded above, the outer angle frequently acuminate; aperture occupying rather less than the upper half of the front of the cell, the margin slightly thickened; three or four long, curved, hollow spines articulated below the margin posteriorly, and frequently a single spine anteriorly from the side of the aperture lower down. A minute capitate avicularium on the edge of the aperture below.

REFERENCES.—*Stirparia glabra*, Hincks, Ann. and Mag. Nat. Hist., March, 1883; *Bicellaria glabra*, Busk, Challenger Polyzoa, Part I., p. 35, pl. vi., fig. 1.

Lorne, a single specimen, Mr. Wooster.

Forms tufts, two or three inches high, attached by slender radical fibres. The stem and branches are calcareous, divided into usually alternately longer and shorter portions distinctly articulated together, the internodes enlarged at their rounded extremities, and generally having a furrow caused by a deficiency of calcareous matter on two sides. The clusters of zoœcia originate from the upper ends of the larger internodes. The first cell is turbinate, with about six long spines, and is articulated to a hollow in the internode. Many of the shorter internodes are barren, but have a small opening similar to those to which the zoœcial clusters are articulated.

The figures and description are taken from South Australian specimens, the only Victorian specimen I have seen being a small, imperfect fragment. It occurs also in Western Australia.

EXPLANATION OF FIGURES.

PLATE 195.—Fig. 1, specimen, natural size. Fig 2, portion of another specimen, magnified. Fig. 2*a*, basal part of zoœcial tuft of same, more highly magnified.

PLATE 195, FIG. 3.

BEANIA INTERMEDIA (HINCKS, SP.).

[Genus BEANIA (JOHNSTON). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Bicellariidæ.)

Gen. Char.—Zoarium creeping or loosely adnate. Zoœcia disjunct, connected by (usually) corneous tubes, erect or decumbent, ovate or boat-shaped, entirely open in front and filled in by a thin membrane. Usually a capitate, pedunculate avicularium, perfect, aborted, or altered in form, on one or both sides towards the upper extremity, in some species absent.]

DESCRIPTION.—Zoœcia much elongated, narrow, sub-erect, anterior extremity rounded, posterior narrow, two short spines or denticles above, and one longer on each side; a capitate avicularium on each side above the lower spine. Each zoœcium connected with one in front by a considerable tube arising from the back and with one on each side by a tube near the posterior extremity. Posterior surface smooth.

REFERENCE.—*Diachoris intermedia*, Hincks, Ann. and Mag. Nat. Hist., Aug., 1881.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

The only specimen I have examined is not in very good condition, but there can be no doubt of its identity with Hincks' species. The points of origin of the lateral connecting tubes seem to vary. In my specimen they are mostly near the posterior extremity, while Hincks describes them as being a little above the middle; in one of the figured zoœcia it will be seen that they are not opposite, one being much farther forward than the other.

EXPLANATION OF FIGURES.

PLATE 195.—Fig. 3, anterior view of part of zoarium, magnified. Fig. 3*a*, lateral view of two zoœcia.

PLATE 195, FIG. 4.

BEANIA CONFERTA (McG.).

DESCRIPTION.—Zoœcia large, each connected with six others by very short tubes; six large, articulated spines above, of which two from the summit project nearly directly forward, a similar pair (one on each side) originating a little farther back point in the same direction, and the third pair, arising opposite the lower edge of the mouth, project upwards and forwards and are curved inwards at their bases; on each side of the aperture a double row of long, stout spines, the outer directed forwards

and outwards, and the inner alternating with these, arching closely over the front of the cell and meeting in the mesial line. Dorsal surface smooth, glassy; in many, especially the marginal cells, a round mark on each side towards the base, probably indicating the attachment of a radical fibre. No avicularia.

Portland, Mr. Maplestone; Port Phillip Heads, Mr. J. Bracebridge Wilson.

This species is readily distinguished from the other Australian forms by the closeness of the cells, the six large spines at the anterior extremity, and the absence of avicularia. The peculiar arrangement of the marginal spines, directed alternately outwards and inwards, is not constant, but when present is very striking. It is closely allied to the form described, from Algiers, by Mr. Hincks (Ann. and Mag. Nat. Hist., Aug., 1881) as *Diachoris hirtissima*, var. *robusta*, from which it differs in having two instead of three superior spines and in the total absence of avicularia.

EXPLANATION OF FIGURE.

PLATE 195.—Fig. 4, single zoœcium, magnified.

PLATE 195, FIG. 5.

BEANIA WILSONI (McG.).

DESCRIPTION.—Zoœcia connected with six others by long corneous tubes, suberect; two or three short, straight, slender spines, and one or two sharp, incurved spines on the margin on each side. Posterior surface smooth. A large capitate avicularium articulated at the upper part of the zoœcium on each side.

REFERENCE.—P. H. MacGillivray, Tran. Roy. Soc. Vict., Nov., 1884.

Port Phillip Heads, Mr. J. Bracebridge Wilson.

Evidently closely allied to the South African *Diachoris distans* of Hincks, from which it differs in having avicularia on both sides, and in the absence of the round marks of the radical tubes posteriorly.

EXPLANATION OF FIGURES.

PLATE 195.—Fig. 5, group of zoœcia, anterior view, magnified. Fig. 5*a*, posterior view of single zoœcium.

PLATE 195, FIGS. 6 AND 7.

VERRUCULARIA DICHOTOMA (BUSK, SP.).

[Genus VERRUCULARIA (VON SUHR). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Farciminariidæ.)

Gen. Char.—Zoœcia elliptical or rounded, convex, bordered by a narrow chitinous line, alternate in longitudinal series, separated laterally by an intercellular substance. Mouth a little below the summit. No avicularia.]

DESCRIPTION.—Zoarium membranous, consisting of bi- or trichotomously divided branches. Zoœcia arranged around an imaginary axis, alternate in longitudinal series separated by a smooth intercellular space, elliptical or ovate, separated from those of the same series by a narrow quadrate space; each zoœcium surrounded by a narrow chitinous rim, a similar line also on each side of the spaces joining those of a series; mouth above the middle of the zoœcium, rounded, the lower lip forming a projecting membranous valve.

REFERENCES.—*Farciminaria dichotoma*, Busk. Quart. Journ. Mic. Sc., New Ser. i. 155. *Flustrella dichotoma*, Hincks, Ann. and Mag. Nat. Hist., May, 1884.

Port Phillip Heads.

This species has a close affinity in its structure to *Flustrella*, but I cannot agree with Hincks in referring it to that ctenostomatous genus. It, however, undoubtedly forms a close connecting link between the two sub-orders. It seems to me that, notwithstanding the absence of avicularia and oœcia and the structure of the mouth, it ought more properly to be referred, as has been done by Busk, to a family of Cheilostomata along with Farciminaria.

It occurs in tufts, one or two inches high, consisting of numerous di- or trichotomously divided cylindrical branches. The zoœcia are arranged in usually six longitudinal series, separated from each other by a continuous intercellular substance; each zoœcium is surrounded by a narrow chitinous line, a similar line also bounding the space by which the cells of a series are separated from each other. They are convex; the mouth projects, the lower lip forming a nearly quadrate flap with a narrow thickened chitinous rim.

Von Suhr, in founding the genus, placed it among the algæ, but the erroneous interpretation of its structure is no reason, as already stated by Busk, for not adopting his name.

EXPLANATION OF FIGURES.

PLATE 195.—Fig. 6, specimen, natural size. Fig. 7, portion of branch of another specimen, magnified. Fig. 7*a*, single zoœcium of same, more highly magnified.

The specimens and descriptions of the Polyzoa illustrated by this plate are from Mr. MacGillivray.

FREDERICK McCOY.

Thuricopora
Micropora
Phyllopora

ZOOLOGY OF VICTORIA
(Polyzoa)

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PLATE 196, FIG. 1.

THAIROPORA ARMATA (McG.).

[Genus THAIROPORA (McG.). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Microporidæ.)

Gen. Char.—Zoœcia calcareous, traversed by bands or transverse fissures and covered with a continuous epitheca; mouth arched, higher than broad, lower margin of operculum hollowed; a stout, unarticulated, mamillate or bullate process in a separate tract on each side of the mouth. Avicularia at the base of or replacing zoœcia, mandible strengthened by a stirrup-shaped thickened chitinous band.]

DESCRIPTION.—Zoœcia quadrate, alternate, of a whitish colour, calcareous layer granular or perforate, with few indistinct lines; epitheca rather thin. Oral processes large, of equal size. Avicularian mandibles broadly lanceolate, directed upwards, strengthening band produced upwards from the junction of the lateral branches and with a broad membranous band on either side.

REFERENCE.—P. H. MacGillivray, Trans. Roy. Soc. Vict., Dec., 1881.

Queenscliff.

EXPLANATION OF FIGURE.

PLATE 196.—Fig. 1, group of zoœcia magnified, showing two avicularia.

PLATE 196, FIG. 2.

THAIROPORA MAMILLARIS (LAMX. SP.).

DESCRIPTION.—Zoœcia quadrate, alternate; calcareous lamina very thin, with few lines; epitheca thick, brown or purple. Mouth with the oral processes of moderate size, equal or occasionally one larger. Avicularian mandibles elongated, branches of strengthening band meeting at an acute angle and produced into a vertical process, without membranous margins.

REFERENCE.—Prod. Zool. Vict., pl. 25, fig. 4.

This species has already been described as *Membranipora mamillaris* and figured on plate 25, but a fresh figure is now given to better show the differences between it and *T. armata*, from which it is readily distinguished by its purplish or dark brown colour, the thicker epitheca, and especially by the different form of the stirrup-shaped support of the avicularian mandible which has no membranous margin.

EXPLANATION OF FIGURE.

PLATE 196.—Fig. 2, Two zoœcia and avicularium.

PLATE 196, FIG. 3.

THAIROPORA JERVOISII (HINCKS SP.).

DESCRIPTION.—Zoœcia large, alternate; calcareous lamina thick, finely granular or punctate, usually traversed by two prominent raised lines crossing the zoœcia and connected in the centre by a similar vertical line, or by two from one side meeting about the centre and continued as a single line across the remainder of the zoœcium. Mouth large, lofty, oral processes large mamilliform. Avicularian mandible broadly triangular, the lateral branches not produced and with a very narrow membranous fringe.

REFERENCE.—*Steganoporella Jervoisii*, Hincks, Ann. and Mag. Nat. Hist., 1880; *Thairopora Jervoisii*, MacGillivray, Tr. Roy. Soc. Vict., July, 1886.

Sorrento, Rev. Dr. Porter.

Of this species I have only a single Victorian specimen, but I have received several from South Australia. It differs from *T. armata* and *mamillaris* in the greater size of the zoœcia, the strong band on the calcareous lamina, and the different structure of the avicularian mandible. The avicularia seem to be very rare and are present on only one of my specimens which I unfortunately did not receive until after the plate was lithographed. As far as I can make out from an examination *in situ* there is an extremely narrow scarcely perceptible fringe. Almost all the specimens are destitute of the epitheca, but in one it appears in parts as a thin silvery layer. None of my specimens have the lateral foramina described and figured by Mr. Hincks, in consequence of which he referred it to the genus *Steganoporella*, although he subsequently (Ann. and Mag., 1887) mentions it as a *Micropora*.

The genus *Thairopora* as first proposed by me was differentiated from *Membranipora* by the presence of a complete articulated operculum. Subsequent examination has shown, however, that the front wall is not membranous, but consists of a calcareous layer covered by a chitinous epitheca. The calcareous lamina is very thin in *T. mamillaris*, but of considerable thickness in the others. In *T. mamillaris*, *armata*, and *Jervoisii*

it is also traversed by various thickened lines or bands, much less prominent in the first. In *T. Woodsii* and *dispar* it is crossed, a little below the mouth, by a transverse or oblique fissure, the edges of which are finely denticulated. The true *Microporæ*, to which the genus is most nearly allied, agree in having a calcareous anterior wall covered by a thick epitheca, with the lower margin of the oral aperture thickened and the lip formed by a complete articulated flap. The form of the mouth, however, is quite different; in *Thairopora* it is very much loftier and narrower and always has a thick, calcareous, sessile, mamilliform or bullate process in a separate space on each side, frequently differing in size; while in *Micropora* the mouth is wider than high, and there are either no oral processes or they are slender articulated spines.

The peculiar dividing lines or fissures on the calcareous front walls are quite different from anything seen in *Micropora*. I am not sure that it would not be advisable to separate the species with the transverse fissures as a distinct genus. A similar division exists also in *Diploporella cincta*, which also agrees in the form of the mouth and operculum and the presence of the thick sessile oral processes. The structure of the zoœcium, however, is otherwise so distinct as to leave no doubt of the propriety of referring it to a distinct genus.

PLATE 196, FIGS. 4, 5, AND 6.

MICROPORA CORIACEA (ESPER. SP.).

[Genus MICROPORA (HINCKS). Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Microporidæ.)

Gen. Char.—Zoœcia with the front wall calcareous, covered with a thick epitheca; no transverse bands or fissures, but frequently several large perforations. Mouth with lower lip straight and thickened, wider than high; lower edge of operculum straight; oral spines either wanting or slender and articulated. Oœcia external. Avicularia at the base of zoœcia.]

Description.—Zoœcia ovate or quadrate; separating margins thick and prominent, frequently raised into a clavate process on each side of the mouth; surface smooth, granular or punctate, frequently with a distinct round foramen on each side. Mouth arched above, lower lip thickened and usually finely crenulated. Oœcia large, convex, prominent or subimmersed, smooth, or tubercular, or umbonate, or slightly carinate. Avicularia small, with triangular mandibles, situated on separate tracts at the bases of zoœcia.

References.—*Membranipora coriacea*, Busk., Brit. Mus. Cat. Mar. Pol., ii., 57, pl. lxxiii., figs. 4–5; *Micropora coriacea*, Hincks, Brit. Mar. Pol., p. 174, pl. xxiii, figs. 5–7.

Common on shells and stones.

This species varies a good deal. The anterior surface is smooth or granular and frequently has a large round pore on each side, generally towards the mouth. The separating margins are occasionally (in European specimens usually) raised into a small clavate boss on each side of the mouth. The oœcia are mostly subimmersed, but are sometimes quite prominent.

A very marked variety which I have described (Trans. Roy. Soc. Vict., 1886) as *angusta* is not uncommon. The zoœcia are very long and narrow, quadrate; the margins very prominent and crenulated; the surface granular. There are no distinct foramina, but a depression in some cases gives an obscure appearance of such. The lower lip is thick and pouting. The oœcia are sub-immersed, usually without any elevation but occasionally with a slight knob or ridge. The whole zoarium is silvery and frequently only loosely adnate. *Steganoporella elongata* (Hincks, Ann. and Mag. Nat. Hist., Nov., 1880) from Africa very much resembles this form. Mr. Waters also (Ann. and Mag. Nat. Hist., July, 1889) refers some specimens from Port Jackson to the same species as *Micropora elongata*, stating that in examining a series there is little difference between it and *M. coriacea*. He also mentions that in some of the zoœcia the marginal openings (opesiules of Jullien) are not to be seen while in others there are more than one on each side.

Explanation of Figures.

Plate 196.—Fig. 4, group of zoœcia from a colony with the anterior surface nearly smooth, the lateral pores large, the margins not raised at the oral apertures and the oœcia prominent. Fig. 5, part of another colony, having the surface granular and punctate, the margins forming clavate knobs and the oœcia umbonate. Fig. 6, var. *angusta*, showing the elongated quadrate zoœcia, the thick crenulated margins, the pouting mouth, and subimmersed oœcia.

PLATE 196, FIGS. 7–10.

RHYNCHOPORA BISPINOSA (JOHNSTON SP.).

[Genus RHYNCHOPORA (HINCKS). (Sub-kingdom Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Family Escharidæ.)

Gen. Char.—Zoarium encrusting. Zoœcia closely adherent to each other. Primary mouth transversely elongated, straight, or with a slight sinus in the lower lip; secondary mouth with a prominent mucro on the lower margin, and an uncinate process immediately above it within the mouth.]

DESCRIPTION.—Zoarium encrusting. Zoœcia when young ovate or pyriform, distinct, and horizontal; when older becoming small, confused and indistinct; sometimes perforated at the margins; surface usually smooth but occasionally rough or tubercular. Primary mouth transversely elliptical, with a very slight sinus in the lower lip and two straight, articulated spines (mostly absent) above. Secondary mouth rounded, with an uncinate process within towards one side; a transverse suboral avicularium, with pointed mandible on the anterior part of a mound-like elevation, or a prominent mucro. Other smaller avicularia on elevations on the front of the zoœcia. Oœcia prominent in the younger parts, but becoming subimmersed or immersed in the older, with the orifice closed by a calcareous operculum.

REFERENCE.—*Rhynchopora bispinosa*, Hincks, Brit. Marine Polyzoa, p. 385; pl. xl., figs. 1–5.

Port Phillip Heads.

This peculiar species is exceedingly variable. The oral spines are very rarely present. As growth proceeds in the young cells an uncinate or anvil-shaped process is developed towards one side of the mouth and usually a smaller more erect process from the other, the two frequently forming a complete or nearly closed round opening. Below or on the front of the uncinate process a large transverse avicularium is formed on a mound-like elevation, or in its place a prominent rostrum, or very rarely both. In many specimens no avicularia are found. In the usual condition of the older parts, the zoœcia are smaller, indistinct, with the mouth large, roundish, and the lower edge with a large transverse avicularium obscuring the parts within. In many zoœcia, especially the older, there are one or more smaller horizontal avicularia on large elevations. These, however, as well as the oral are not infrequently altogether absent. The peristome may be produced into one or more processes on either side. The suboral rostrum

also varies very much, being of moderate size and smooth, or large and granular or tubercular. The zoœcia are usually smooth, but may be covered with large granulations, and the margin has frequently a row of perforations. The oœcia are at first prominent, but become immersed with age. In the older ones the opening is closed by a thick operculum, which may be smooth or faintly granular or lined. When deeply immersed the operculum is nearly vertical.

I have several specimens on shell from shallow water which I was at one time inclined to consider as a distinct species. It may be called var. *delicatula*. All the zoœcia are horizontal. The uncinate and opposite oral processes unite or nearly so, and a round elevation is formed on the base of the former. Two glassy elevations first appear below the mouth followed by others over the surface of the older zoœcia. There are few or no avicularia. The oœcia are prominent, smooth, or with a slight umbo, and the opening is small and has no apparent operculum.

EXPLANATION OF FIGURES.

PLATE 196.—Fig. 7, usual appearance of older colonies, showing confusion of cells and oral and zoœcial avicularia. Fig. 8, group of young cells from growing edge of another colony. Fig. 9, marginal zoœcia from edge of specimen of var. *delicatula*, showing primary mouth, uncinate and oral processes, uncinate process with rostral elevation, and two elevations on front of zoœcia. Fig. 10, single oral opening from another specimen.

PLATE 196, FIGS. 11–14.

RHYNCHOPORA LONGIROSTRIS (HINCKS).

DESCRIPTION.—Zoarium adherent. Zoœcia when young, large, ovate or pyriform, distinct, frequently separated by rows of pores, smooth at the extreme edges of the colony but becoming slightly granular farther back; primary mouth transversely elliptical, without sinus; when old indistinct, granular, mouth quadrate, an uncinate process to one side of the lower lip with the sharp point directed nearly across to the other side; below the uncinate process is a small avicularium with broadly triangular mandible on an elevation, which also is frequently developed into a mucro. Numerous large avicularia on the front of the zoœcia with long, ligulate mandibles pointing downwards. Oœcia immersed, smooth or slightly granular, with a calcareous operculum.

REFERENCES.—Hincks, Ann. and Mag. Nat. Hist., Aug., 1881; *R. profunda*, MacGillivray, Tr. Roy. Soc. Vict., Oct., 1881.

Port Phillip Heads ; Portland, Mr. Maplestone ; Warrnambool, Mr. Watts.

In many of the younger zoœcia the oral avicularia are not developed. The extreme marginal zoœcia, before the formation of the uncinate processes, are smooth, those behind are granular. In the fully formed zoœcia the surface is glistening and granular. The mouth is irregularly quadrate, the elevation on the upper side of which the avicularium is situated is sometimes scarcely apparent, at other times, as in the figure, it is of considerable size. It may rise into a mucro, in some specimens becoming developed to such an extent as to obscure every other part. The peristome may have one or more small pointed processes. The zoœcial avicularia are usually as figured, but occasionally they are extremely narrow, or may be as small as in *R. bispinosa*.

The form which I described as *R. profunda*, I now believe to be a mere variety of the present, in which the calcareous matter is so much developed that the mouth, with the large uncinate process, lies very deep, and the surface is very roughly granular or nodular.

Explanation of Figures.

Plate 196.—Fig. 11, portion of a fully developed specimen. Fig. 12, two marginal zoœcia from another specimen. Fig. 13, young zoœcia from var. *profunda*. Fig. 13*a* and 13*b*, portion of same specimen, showing fully formed zoœcia. Fig. 14, portion of specimen with excessive growth of mucros.

Mr. MacGillivray has furnished the specimens and descriptions for this plate.

Frederick McCoy.

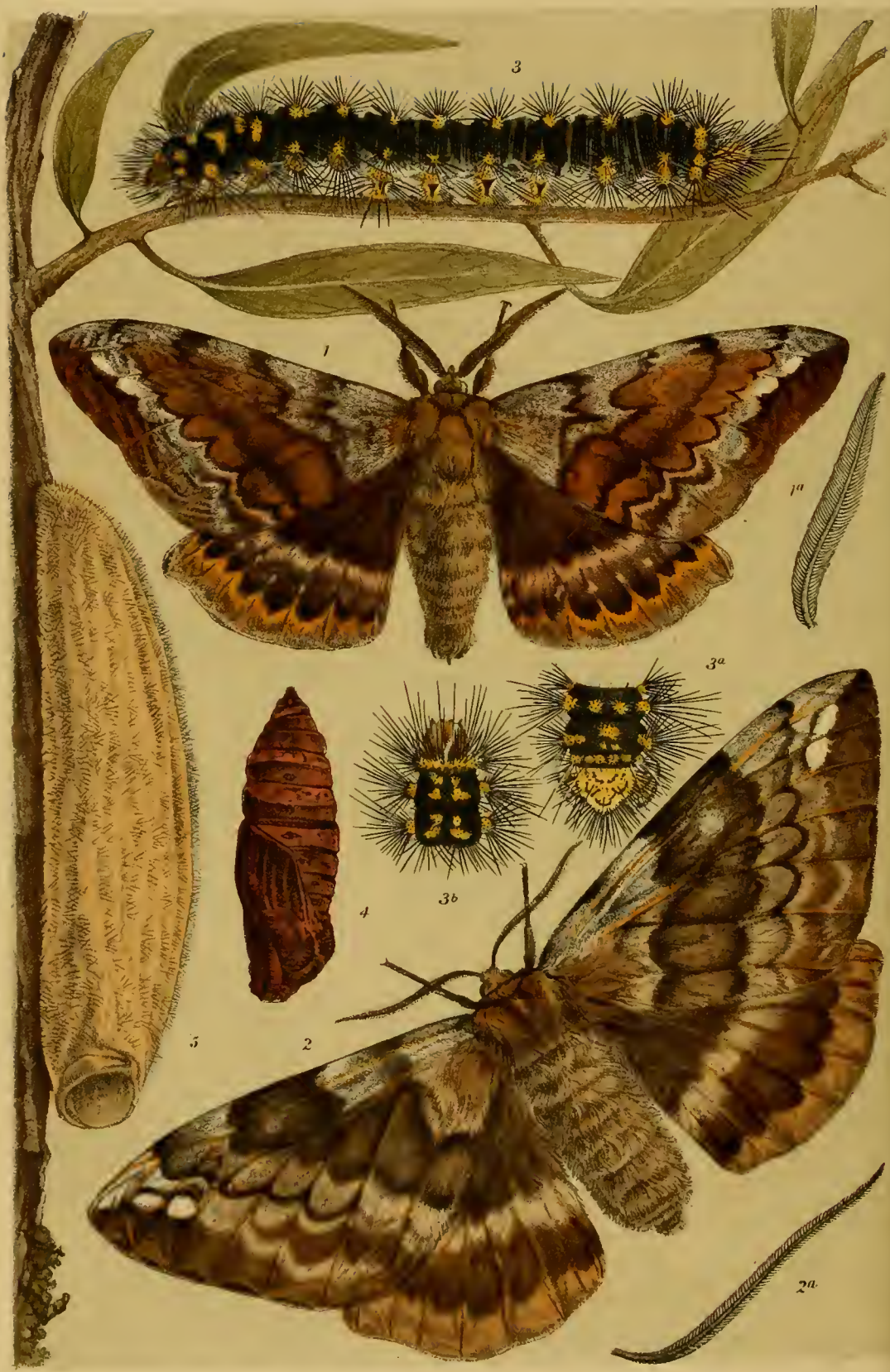

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PLATE 197.

CHELEPTERYX COLLESI (GRAY).

[Genus CHELEPTERYX (GRAY) = MEGETHNA (WALK.). (Sub-kingdom Articulata. Class Insecta. Order Lepidoptera. Section Heterocera. Tribe Bombyces. Family Liparidæ.)

Gen. Char.—Male: Body very thick. Antennæ much longer than thorax, slender; bipectinate in both sexes; the incurved pectens deflexed, of the male long, of the female much shorter. Proboscis or maxillæ obsolete. Palpi stout, short, porrect, hairy, and obtuse; first joint very short, third joint minute, conical. Head, thorax, and abdomen and base of wings pilose, thickly clothed with long fine hairs, longest at tip of abdomen. Abdomen as long as hind wings, Wings long, broad, entire; anterior ones subtriangular; anterior margin much longer than the others, straight near base, gently convex on distal half; outer margin oblique in males, concave in the middle; in females nearly straight, inner angle much rounded, tips nearly rectangular, rounded; posterior wings with anterior margin reaching considerably beyond the posterior portion of anterior wings, posterior edge rounded, but concave near falcate apex; surface of wings covered with hairy scales, slightly diaphanous and with two clear spots near apex of anterior pair; discoidal cell of posterior wings closed. Legs stout, femora densely furred, anterior tibiæ tufted below; long slender spines at apex of four posterior tibiæ, two on second pair, four on hind pair. *Female:* Size much larger than male. Palpi more slender than in male, third joint elongate, about half the length of second. Antennæ bipectinate, but pectens much shorter than in male. Larvæ with sixteen legs, and rows of tubercles set with long stinging hairs. Pupæ in cocoon. Australia.]

DESCRIPTION.—*Male:* Usual width of Victorian specimen from tip to tip of expanded wings, 5 inches 3 lines. Base, anterior margin, and posterior angle greyish brown, upper portion of outer margin dark brown, middle portion of wing reddish chesnut brown; a branched pair of narrow, undulating, blackish-brown streaks uniting before reaching inner edge on basal third of wing, a broader less definite one crosses middle of reddish third, and a third narrower one scalloped between the veins forms outer boundary of reddish portion; beyond which is an irregular, broad, greyish, scalloped band; two oval, talc-like, white, translucent spots near apex in dark-brown outer border between the second, third, and fourth nerves; a small, light, roundish spot about middle of length and one-fourth of width from anterior edge; posterior wings very dark rich chocolate brown, with a broad, indefinite, lighter band beyond the middle, and an indistinct row of yellowish spots on the veins; the dark colour scalloped between the veins and bordered by a rich brownish yellow, narrow line, beyond which a broad band of rich greyish brown forms the posterior margin. Body brown, darkest on front of thorax, lightest towards tip of abdomen. Underside of both wings rich, minutely speckled, brownish grey with two undulated, narrow, dark streaks crossing them a little outside the middle, within which is a large, rich blackish brown, triangular space within a light grey anterior margin, and containing a light angular spot near outer edge, and the median spot, which is more conspicuous than on upper side; head, antennæ and legs dark brown, tuft under anterior tibiæ bright glossy brownish yellow; under side of thorax and abdomen pale yellowish buff or fawn colour. *Female:* About 6 inches from tip to tip. Much duller and lighter than the male, with nearly similar markings of pale cold sepia brown and minutely speckled brownish ashy grey; the veins on posterior wings ochraceous near outer margin; median spot and two translucent talc spots near tips more conspicuous than in male; under side marked like male but paler, and with the central and angular light spots near outer edge of dark triangular basal half more conspicuous. *Larvæ:* about 4 to 5 inches long, covered with close set, glossy coating of fine depressed hair of a black colour, with narrow, transverse, whitish bands, and eight longitudinal rows of large yellow tubercles (the second and third segments having an additional pair in front of the

others), and the first segment having a raised yellow band across the back with a tubercle at each end, all set with very long stiff, rough, stinging bristles, the anterior and posterior ends have most of the black stinging bristles, and they are mixed with long white hairs there and over the legs; legs, head, and last segment and two raised bands between the legs, yellow. Pupa rich reddish chocolate brown; about 2 inches long and 8 lines wide, terminated with a bunch of short bristles at posterior end. Cocoon about 4 inches long, and 1 inch wide, fusiform, longitudinally furrowed, of dull brownish-white tough silk, set with the stinging hairs of the larva.

REFERENCES.—Trans. Ent. Soc. Lond., v. 1, p. 122; = *Saturnia Laplacei*, Feisthamel Voy. de la Favorite, t. 8, 9; = *Festra affabricata*, Wallengren Eugenies Resa Omkring Jorden.

Of all the *Bombyces*, or full-bodied Moths, this is the most striking from its great size and brilliant colouring. The Victorian specimens are a little smaller and duller than those of New South Wales, where it is even more abundant than with us.

The larvæ feed on the leaves of different so-called Gum-trees, or species of Eucalyptus, particularly young ones of 10 to 15 feet high, and not on the very large ones as a rule. They are common from October to the end of the year, reaching their adult length and assuming the pupa state towards the end of December, weaving the large, tough, silk cocoon in crevices of the bark or under the loose bark of Gum-trees. The stinging spines or bristles with which the larva is covered pierce the skin of the hands very readily, producing a very unpleasant irritation, and it weaves them into the outer surface of the cocoon at the end of its larval life, continuing this offensive and defensive provision to the cocoon for the pupa stage.

The perfect insect or imago comes out in March and April.

In Victoria this fine insect is chiefly found in Gippsland, where so many other New South Wales animals seem to extend south along the ranges; it is common at Mordialloc and Brighton, near Melbourne, but Mr. Kershaw informs me that it has not occurred to him when collecting in any of the northern and western parts of the colony.

EXPLANATION OF FIGURES.

PLATE 197.—Fig. 1, male, natural size. Fig. 1*a*, bipectinate antennæ, magnified. Fig. 2, female, natural size. Fig. 2*a*, bipectinate antennæ, magnified. Fig. 3, larvæ, natural size, side view. Fig. 3*a*, hind segments of larvæ, viewed from above. Fig. 3*b*, head and anterior segments, viewed from above. Fig. 4, pupa, natural size. Fig. 5, cocoon, natural size.

FREDERICK McCOY.

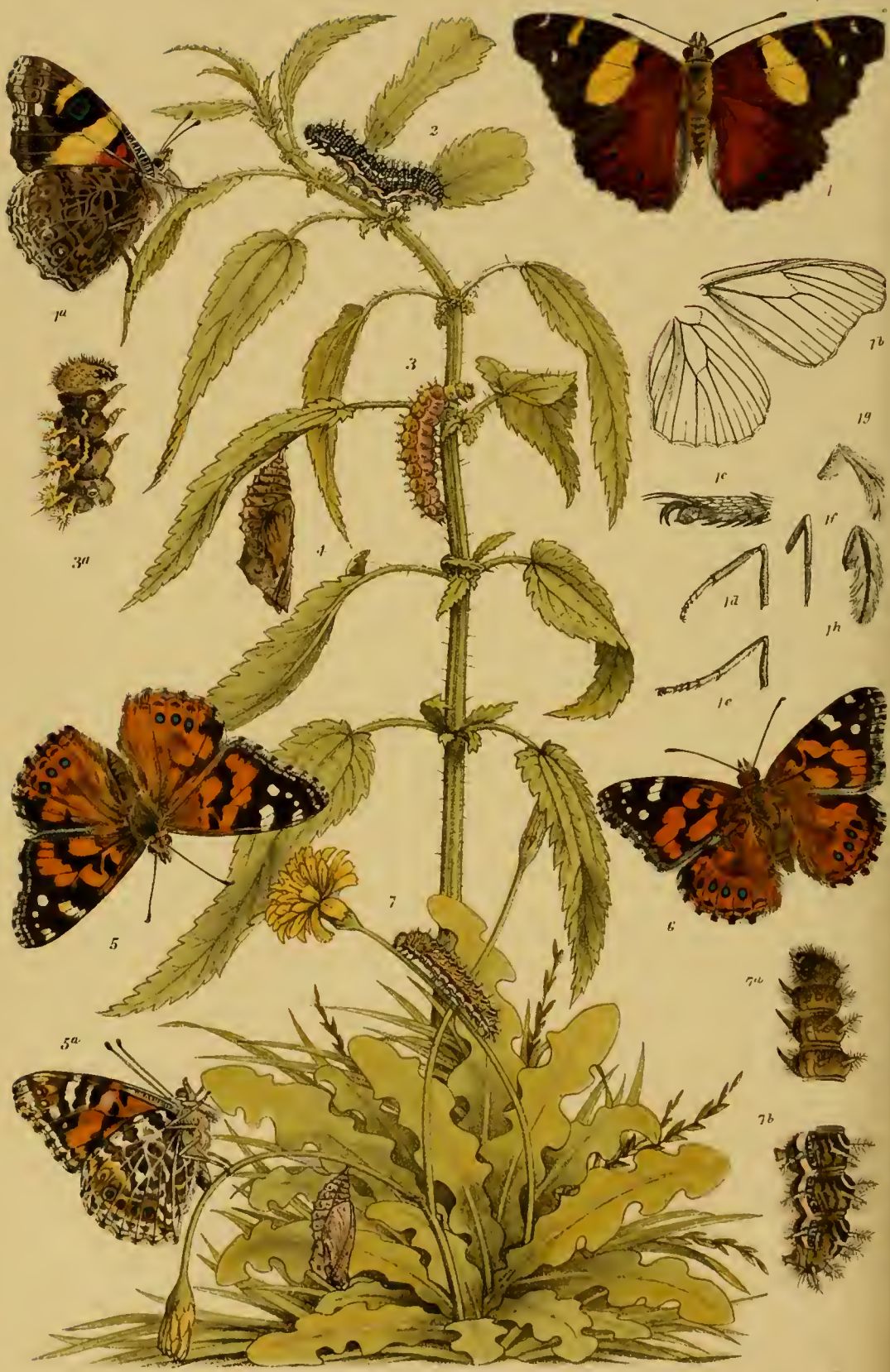

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PLATE 198, FIGS. 1–4.

PYRAMEIS ITEA (FABR.).

AUSTRALIAN ADMIRAL BUTTERFLY.

[Genus PYRAMEIS (HÜBN.):<CYNTHIA (FABR.). (Sub-kingdom Articulata. Class Insecta. Order Lepidoptera. Section Rhopalocera. Family Nymphalidæ. Sub-family Nymphalinæ.)

Gen. Char.—*Head* moderately broad, densely hairy; eyes closely covered with fine short hairs; palpi long, converging at tips; second joint elongate, thickened beyond middle, with long hairs on upper and outer sides, scaly and with fine down below; terminal joint large, compressed, acuminate, and slightly downy. Antennæ rather long, club abrupt, flattened, elongate ovate, terminal joint minute, pointed. Thorax large, densely hairy, especially on breast and back of metathorax. *Fore wings* a little narrowed and produced at upper outer angle; costa only slightly arched; outer margin sinuate, concave about middle; inner margin nearly straight; costal nervure ending about middle of costa; first and second sub-costals rising close together, a little before end of discoidal cell; third sub-costal arises about one-third from cell to apex, and ends at apex; upper disco-cellular nervure obsolete, middle one very short, and third or lower disco-cellular nervule very long, nearly obsolete (replaced by a sulcus in the wing, indicated by dotted line in our plate), ending on third median nervule near its origin, so that discoid cell seems open or nearly so. *Hind wings* broad; costal nervure slightly arched, prominent at base; hind margin dentate-sinuate, lobes on first and third median nervules larger than the rest; anal angle well marked; inner margins meeting to form a deep groove to a little beyond end of abdomen, beyond which they are notched and divergent; costal nervure extending to apex; discoidal cell very short, closing lower disco-cellular nervule, long, oblique (dotted in our plate), joining median nervure at origin of its second nervule; internal nervure reaching end of inner marginal groove. *Fore legs* of male very densely covered and fringed with hair, especially on tibia and tarsus; of female similar, but with five indistinct articulations, spinous beneath, and hairy, chiefly on basal portion. *Middle and hind legs* long, stout, scaly; tibiæ with two inner and one outer row of spines, terminal spurs long; tarsi very spinose at sides and below; terminal claws stout, curved. *Abdomen* short, thick. *Larva* elongate, with rows of rigid spines set with bristles; head and next segment without spines. *Pupa* stout, angulated, tuberculated on back of abdomen; head bluntly bifid; surface gilt in spots and patches. Cosmopolitan.]

DESCRIPTION.—*UPPER SURFACE.*—Head, palpi, thorax, and abdomen blackish, covered with dense, dark, rich brown hairs. Antennæ blackish-brown, tipped with tawny. *Anterior wing:* Basal portion of a rich, light, rusty yellowish-brown, bounded about midde of discoidal cell by a narrow black band concave outwardly, arching from costa to origin of first or lower median nervule; beyond this the wing, obliquely crossed by a large oval spot of a rich cream colour, extending from costa to sub-median nervure, and from origin of first median nervule to origin of second median nervule; beyond this to apex and inner margin black, with three white spots, the inner one largest, tinged with cream colour, divided by two nervules a little nearer large cream spot than tip of wing, and extending from costa to second or lower discoidal nervule; second smallest, narrow, arched, nearer to tip than to first spot, traversed by one nervule; third spot oblong, in space between third or upper median nervule and second or lower discoidal nervule, and half-way between first spot and margin; fringe with small white lunules between nervules. *Posterior wing:* Basal portion, as in anterior wing, rusty yellowish-brown, dense scales and long hairs, the hairs on channel of deflected inner edge very long and of a lighter mouse-colour brown; beyond this the disc, bright rusty chestnut, a broad anterior and narrower outer marginal space brownish-black, with a row of narrow white lunules in the fringe at edge between the nervules; a curved row of four round black spots, with small blue centres within the black margin on the disc, and a narrow light lunate

mark on edge of black margin at anal angle, narrowly edged above with blue. *UNDER SURFACE.—Anterior wing:* Base bright chestnut, with black mark and cream median spot, as on upper surface; costal area, as far as large central cream-colour patch, black, with many transverse white lines; black apical portion as in upper surface, but brownish near tip; first arched cream-colour spot larger than on upper sides, and with a large blue circle with black centre, on black between it and median cream patch; second and third spots as on upper surface, but with two ocellated spots of black outlines and black dot in centre between them on brownish apical area; two faint purplish-grey lines parallel to margin near edge. *Posterior wing:* Mottled with three shades of dark walnut-wood brown and dull purplish-grey lines; five irregularly unequal circular ocellated spots under those of upper surface, but much larger, a dark outline and small central dark dot to each on brown ground; beyond this a broad greyish margin to edges, including a dark narrow continuous undulating line in middle, parallel to edges; near end of internal nervure, between it and hind edge, is a light-grey triangular patch with a conspicuous black round spot in its middle; two or three transverse oblong dark-brown patches on the discoidal cell, and three or four angular ones on the spaces above and below the basal half of the costal nervure, and first and second sub-costal nervules are narrowly edged with white. *Measurements:* Expanse of male from tip to tip, 2 inches; of female, 2 inches 4 lines. *Larva:* Varying in colour, some black, with numerous transverse rows of minute white dots, greyish below, feet and spines blackish, with a conspicuous broad light-colour band on each side over the feet, and a more slender one over it on each side. Others pale-brownish on back, flesh colour on sides and below, and with yellowish spines and feet. Length a little over 1 inch. Feeds on nettles. *Pupa:* Richly gilt, head bifid, with two acute conical lateral angles; two rows of large conical spines along abdomen. Length 11 lines.

REFERENCE.—Fabr. Syst. Ent., p. 498; Sp. Ins., p. 82; Don. Ins. N. H., t. 26, f. 1.

All the Butterflies of the family *Nymphalidæ* (comprising over four thousand distinct species, or about four times as many as any other family of diurnal *Lepidoptera*) agree in the peculiarity of having the anterior pair of legs too small to be used for walking or clinging in both sexes, but most defective in the males, without joints to the tarsus or claws, the female having the tarsus indistinctly 5-jointed, but without claws; while the genera like *Pyrameis* of the sub-family *Nymphalinæ* have the discoidal cell in the hind wings open (that is, not closed by the lowest disco-cellular nervule, which is absent). In the two species on our Plate 198 there is in its place a slight narrow groove or inflection of the surface in the position usually held by the lower disco-cellular nervule, which casts a shadow, making it look like a nervule and possibly leading to mistakes if the character be carelessly observed; I have represented it with dotted lines on the outline plan of the nerves of the wings, Fig. 1*b*.

In the two species of *Pyrameis* on our plate the pupa is suspended head downwards by the tip of the tail only, as in others of the family *Nymphalidæ* (hence sometimes called *suspensi*) and generally in those groups having the front pairs of legs aborted.

Like all of the sub-family *Nymphalinæ*, the species of *Pyrameis* are remarkably robust and vigorous in habit, and have conspicuously prominent scaly palpi projecting in front of the head; long stout antennæ; stout spiny middle and hind legs; and the unusually deep groove for the reception of the body formed by the inflection of the dilated inner margin of the hind wings. The males, as usual in Butterflies, are smaller than the females, with more slender, compressed abdomen and larger thorax.

The *Pyrameis Itea* has received the popular name of Australian Admiral from English collectors in Australia, who recognise some relationship to the European species of the same genus, known as the "Red Admiral Butterfly," to which it has, however, only a generic affinity, the specific characters being totally unlike. The habits are like all of the genus, flying vigorously near the ground and to seven or eight feet high, frequenting gardens and resting on flowers, particularly *Lantana*. It is found nearly all the year round and has several broods in the year.

Explanation of Figures.

Plate 198.—Fig. 1, female, upper side, natural size. Fig. 1*a*, ditto, under side. Fig. 1*b*, diagram of nervures and nervules of both wings (the groove or false disco-cellular nervules dotted). Fig. 1*f*, first leg with hairs scraped off, to show anchyloses of tarsal joints (the two points at end are not claws but coarse hairs), magnified three diameters. Fig. 1*g*, ditto, with its hairs seen in profile, magnified two diameters. Fig. 1*h*, ditto, seen in front, magnified two diameters. Fig. 1*d*, second pair of legs, magnified two diameters. Fig. 1*e*, third leg, magnified two diameters. Fig. 1*c*, tarsus and claws of third leg, magnified fifteen diameters. Fig. 2, larva of black variety, natural size. Fig. 3, larva of light-colour variety, natural size. Fig 3*a*, anterior portion of ditto, magnified three diameters, showing compound spines (absent from head and first following segment). Fig. 4, pupa, natural size.

Plate 198, Figs. 5–8.

PYRAMEIS KERSHAWI (McCoy).

The Blue-spotted Painted-Lady Butterfly.

Description.—*UPPER SURFACE.*—Head, thorax, and abdomen covered with dense golden-brown hairs; antennæ blackish-brown tipped with white. *Anterior wing:* Basal portion dusky-black, covered with dense golden-brown scales and hairs; apical portion from apex to beyond middle of costal margin, including end of discoidal cell, black, the inner edge of the black forming two angular projections directed

towards base, the upper one nearly rectangular, the lower one more obtuse and continuous, with a brownish-black outer margin to wing, and containing, nearer to inner edge than to apex, an arched white stripe from costa, divided into three by nervules, truncated below by fifth sub-costal nervure; beyond this a curved row, parallel to outer edge, of four white spots, the upper at costa largest and quadrate, the three lower rounded, upper one smallest, and lower one largest touching discoidal nervule; one row of small lunulate markings parallel to and near hind margin, the upper ones white, two or three lower ones brownish; fringe of edges checkered with white between nervules; median portion of wing pale-reddish tawny, with triangular black spot about middle of discoidal cell, base at upper sub-costal nervure, apex nearly touching inner side of a more acute triangular black mark, the base of which comes from near middle of lower boundary of discoidal cell, continuous below, with irregularly indented arched black mark extending partly along first, second, and third median nervules. *Posterior wing:* Costal and inner portions broadly margined with brownish-black, the latter coated with golden-brown scales and hairs, longest and silky on inflected inner edge; beyond discoidal cell a broad triangular black mark extends from inner dark part, arching towards costal dark margin, but either very thin or more commonly interrupted between upper median nervule and discoidal nervule; beyond this an arched row, parallel to outer edge, of four round spots, the anterior one black, the three posterior bright cobalt-blue, with a narrow black outline; beyond these a row of irregular oval black spots, the two next angle with their outer edges blue, and another row of black rounded or rhombic spots near edge on the nervules, with intermediate white fringe at edge. *UNDER SURFACE.*—Body and legs very pale-brown; palpi greyish-white. *Anterior wing:* Paler, but nearly like upper surface in colour and marking, but usually more distinctly bright pale-red near base, and a small single black dot near base below costa; space between costal and sub-costal nervures transversely striated with alternate blackish and whitish marks as far as black spot in discoidal cell and black of apical portion and base, replaced by pale wood-brown; a broad quadrate white band (tawny on upper surface) crosses costa and discoid cell beyond black angular marks at distal end of discoid cell; other white marks corresponding with upper side. *Hind wing:* irregularly mottled with three shades of pale wood-brown and brownish white; a conspicuous large angular white spot at end of discoidal cell and three on costa; nervules white; two dark spots in discoid cell white-edged; curved row of five round unequal ocellated spots between the nervules, with one or two narrow dark outlines, within which brown with slight blue edge on basal half of three inner spots; row of lunules beyond these round spots purplish-brown, largest and darkest next angle, then a continuous whitish stripe, then a yellowish-brown one, edge with whitish lunules between brown spots on nervules. *Measurements:* Expanse of males, 1 inch 6 lines to 2 inches; of females, 1 inch 11 lines to 2 inches 2 lines. *Larva:* Blackish-brown, with a broad yellowish-white band bordered with interrupted black streaks from third to last segment over bases of legs on each side, and two less distinct darker-yellowish streaks above on each side. All the segments, except the first and second, with branched yellowish-white spines, rather less in length than half the diameter of the body; head blackish; legs ochraceous brown, greyish below. Length about 1 inch. Feeds chiefly on foreign *Compositæ*, particularly the introduced Cape Weed, *Cryptostemmon calendulaceæ*, for which it abandons all native plants. *Pupa:* Pale yellowish-grey dotted with brown, with a few gilt patches; three rows of brightly-gilt conical spines along back, the middle row smallest, and three rows much smaller on each side; about 8 lines long; head bifid, with two blunt conical projections.

REFERENCE.—=*Cynthia Kershawi*, McCoy, Ann. and Mag. Nat. Hist., 1868, p. 76.

Of all Butterflies there is none more famous than the *Pyrameis Cardui* (known to English-speaking collectors under the absurd popular name of "Painted-Lady Butterfly"), on account of its extraordinarily wide geographical range, having been quoted for very many years in most works on Physical Geography and the geographical distribution of animals as almost cosmopolitan; not only abundant in every country "from China to Peru" but from Britain to Australia, where it was said to be common. Of late years more accurate observations have shown that South America does not contain really the true species, and more than twenty years ago (*see* above reference) I pointed out that the Australian representative of the *P. Cardui* might be easily discriminated from the European insect, with which it had been previously confounded, by the three lower round spots on the posterior wings being bright cobalt-blue in the centre, instead of black, a character, as I stated, first mentioned to me six or seven years before by my excellent friend, William Kershaw, the senior taxidermist at the Melbourne Museum, who made our singularly fine and extensive local collection of the Insects of Victoria, and whose unequalled knowledge of the habits and distribution of our Insects, and extraordinary zeal and devotion to his duties as my assistant in this branch of the Museum, I acknowledge, with great pleasure, by dedicating the species to him. The particular character first noticed, I have, for nearly thirty years, and on the examination of literally thousands of specimens, found to have been quite invariable in all the Australian and New Zealand specimens of this our most abundant Butterfly all over the country in all kinds of habitats. It is also a distinctly smaller species than *P. Cardui*. The above measurements give the extremes I have noticed for both sexes, but in each sex the intermediate measurements are by far more common than the extremes set down, and show a very obviously smaller species. Of the male I have only seen one specimen of the smallest size set down, 1 inch 8 lines being the usual size. A few other points of constant difference will be found in the above description, with many curious coincidences, but on the whole I have no doubt of the specific distinctness of the Australian form.

The larva and pupa resemble those of *P. Cardui* very nearly, but are of smaller size. The habits are very much alike; our form, like the European one, being singularly robust and active, flying about even in windy weather, and found nearly all the year through, but most numerous in the hotter months from September to March, and more commonly than any other species, especially where the accidentally introduced Cape Weed (*Cryptostemmon calendulacea*) abounds, as for this it forsakes all other plants.* I note that that excellent observer, Mr. Trimen, does not record this amongst the plants eaten by the larvæ of the true *P. Cardui* at Cape of Good Hope.

In the latter end of September and beginning of October of last year this Butterfly appeared in extraordinary numbers for two or three weeks, accompanied by a day-flying Moth, *Agrotis spina*, almost darkening the sky with their general flight towards the south-east, covering the gear and decks of ships many miles out at sea, and filling the air on land from the northern parts of the colony down south to Melbourne. They poured into Gippsland in such quantities as to spread consternation amongst the settlers, who inundated me with letters inquiring whether their crops or orchards or vineyards would be destroyed by the larvæ expected to follow. I was glad to be able to assure them that the only likely damage would be to hated weeds. The newspapers mentioned the stoppage of trains in the tunnel on the Castlemaine Railway, from the masses of bodies of these insects crushed lubricating the wheels to such an extent that they could not bite the rails as they turned, and came to a standstill until sufficient supplies of sand could be sent.

They frequently rest on the ground or plants for a short time, with the wings expanded horizontally; when sleeping or resting for a long time the wings are brought together erect, with the reddish part of the under surface of the anterior wings concealed by the over-lapping of the hind ones; and when resting

* This curious change of habit in Victorian Insects, abandoning their native food for some introduced plant on which they thrive so much better as to become strikingly more abundant than before, has been remarked upon in our account of the *Agarista*, so destructive to the vine, *see* Decade I., Plate 8.

in this position on bare patches of ground the mottled colouring of the under sides of the hind wings serves to conceal them to a surprising degree.

Explanation of Figures.

Plate 198.—Fig. 5, female, upper side, natural size. Fig. 5*a*, ditto, under side of wings in erect position of prolonged rest. Fig. 6, male, natural size. Fig. 7, larva, natural size. Fig. 7*a*, head and three following segments, magnified two diameters, to show absence of spines on head and next segment. Fig. 7*b*, three posterior segments, magnified two diameters. Fig. 8, pupa, natural size.

Frederick McCoy.

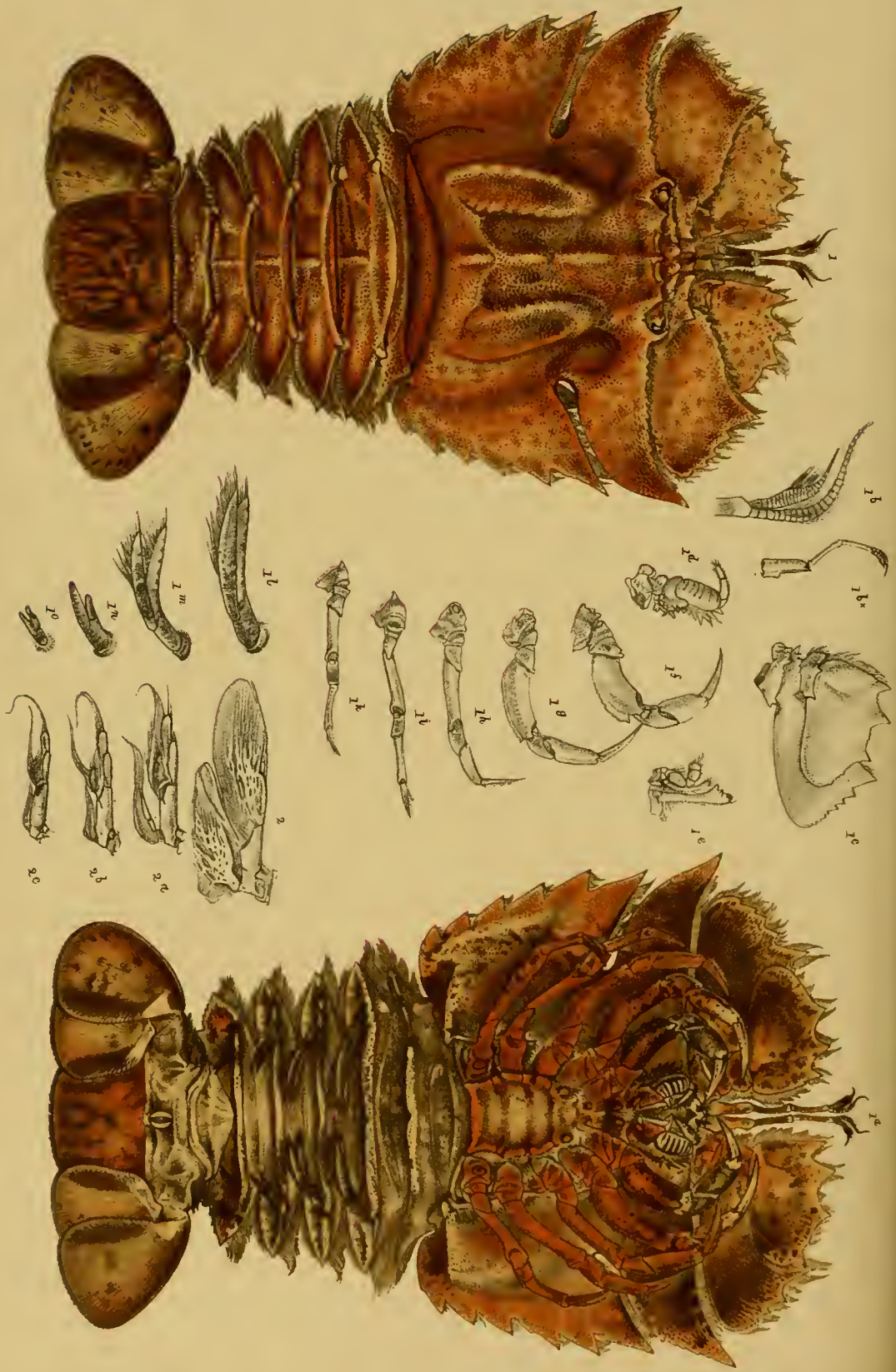
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PLATE 199.

IBACUS PERONII (LEACH).

PÉRON'S IBACUS CRAB.

[Genus IBACUS (LEACH). (Sub-kingdom Articulata. Class Crustacea. Order Decapoda. Section Macrura. Family Scyllaridæ.)

Gen. Char.—Carapace transverse, broader than long, depressed, with a very deep fissure on each side. Rostrum bilobate. Eyes inserted on anterior edge, far removed from the external angles; peduncle thick, recurved, acuminated towards extremity. External antennæ not far anart, squamiform, four-jointed; internal antennæ three-jointed, terminated by two many-jointed setæ. Branchiæ twenty-one. External pedipalps with two first joints externally crested, second joint with many fissures internally.]

DESCRIPTION.—Broad, ovate, male more convex in front, from greater width of second antennæ, than female; greatest width, at outer anterior angle of carapace, equal to length from inner angle of orbit to base of telson or last abdominal joint; sides tapering from anterior lateral angles of carapace to penultimate abdominal segment in nearly straight or very slightly convex lines; space between orbits one-fifth the width of anterior edge of carapace; outer angle a large flat spine curving outwards and slightly forwards from bottom of deep lateral fissure, posterior edge, and to less extent the anterior edge, more abruptly arched forwards and a little outwards; lateral fissure one-fourth the width of carapace at second lateral spine, narrow, parallel-sided, less transverse, or inclined obliquely more forward than anterior margin of carapace, both edges imperfectly crenulated with a row of minute tubercles, lower edge fringed with long hairs; six angular, gradually decreasing teeth or serratures on each side behind fissure, sometimes a smooth, most posterior, rudimentary one*; anterior edge of carapace irregularly serrated by numerous, small, unequal tubercles, arched forwards at outer angles; upper surface of carapace much flattened at the sides, thicker in the middle third, bounded by two lateral smooth keels arising in line with middle of orbits and diverging backwards, so that space between hinder ends is rather less than half the width of the carapace, while between the anterior ends it is less than one-third the width at same level; middle keel divided into four long tubercles; surface nearly smooth, finely granular at margins; granulation coarser behind posterior sulcus and within lateral keels. Outer antennæ, with first joint small, scarcely extending beyond rostrum, second joint very wide, posterior edge smooth, outer edge with five teeth, anterior largest; anterior edge irregularly serrated with small, irregularly unequal, spinose tubercles, inner ones largest; third or anterior joint with convex anterior edge with three large angular teeth; anterior edge of sinus, of carapace, and anterior outer and inner edges of outer antennæ fringed with hair. Inner antennæ with three, slender, long joints; flagella many-jointed, the outer fringed with a large tuft of hair. Four anterior abdominal segments (after the first) each with a longitudinal tubercle in middle continuing the median keel of carapace; sides serrated and fringed with hair; all granulated; fifth segment without median tubercle, but with two transverse rows of small granular spines on hind edge of terminal or coxal pieces, the outer forming an obscure point; sixth joint with granulated hind edge. Telson and lateral flaps of tail soft and

* Although Leach says five, his figure shows six, as in our specimens.

membranous, crustaceous at base. Hind leg of male simple, of female feebly didactyle. Outer maxillipede with a row of spines on outer edge of fourth joint, which is transversely ridged on convex lower surface; thighs of two anterior pairs of legs abruptly thicker than the others. Sternum semi-oval, with a short spine at hind outer angle of last joint and more near middle of outer ends of other joints. Order of length of thighs, two, three, four, one, and five. *Colour:* Reddish, dull cinnamon-brown on upper surface, sides of carapace and outer antennæ spotted with round, darker, unequal clouds of same colour, and a few irregular marks of dark Vandyke brown on telson and lateral tail flaps; underside of abdomen pale yellowish; underside of carapace cinnamon-brown, with blackish-brown on basal portions of outer antennæ and anterior spine of carapace, behind bases of legs and on swimmerets. *Measurements:* Length of average specimen from anterior edge of outer antennæ to end of telson, 4 in. 7 lines. Proportional measurements to that length, as 100: greatest width in front of carapace, $\frac{77}{100}$; depth of lateral sinus, $\frac{18}{100}$; width of ditto, $\frac{2}{100}$; space between inner angles of orbit, $\frac{12}{100}$; length of carapace, $\frac{35}{100}$; width of second abdominal segment, $\frac{43}{100}$; length of telson, or last abdominal segment, $\frac{19}{100}$; length of first joint of outer antennæ, $\frac{4}{100}$; width of ditto, $\frac{8}{100}$; length of second joint, $\frac{24}{100}$; width of ditto, $\frac{25}{100}$; length of third joint, $\frac{2}{100}$; length of lamina, $\frac{13}{100}$; width of ditto, $\frac{17}{100}$; length of first joint of inner antennæ, $\frac{7}{100}$; width, $\frac{2}{100}$; length of second joint, $\frac{6}{100}$; width, $\frac{1}{100}$; third joint, $\frac{5}{100}$.

Reference.—Zool. Misc., v. 2; t. 119.

I retain Leach's name for this species, as the first published, and think it undesirable to use for it, as Mr. Spence Bate has done, Péron's manuscript name *I. incisus* in the Paris Museum, referred to but not used by Leach in his original description.

One enormous specimen, 9 inches long and 5 in. 3 lines wide at front of carapace, presented by D. Best, Esq., from Phillip Island, is more roughly granular than usual and has seven distinct, large, angular teeth behind sinus. Not very uncommon in Hobson's Bay and on the shores outside Port Phillip.

Explanation of Figures.

Plate 199.—Fig. 1, dorsal view of average specimen, natural size, male. Fig. 1*a*, under view of the same. Fig. 1*b*, flagella of inner antennæ, magnified to show tufts of hairs on outer branch. Fig. 1*b*†, inner antennæ, natural size. Fig. 1*c*, one of the outer antennæ, viewed from below, natural size. Fig. 1*d*, outer maxillipede, natural size, showing spinous crest on outer edge of fourth joint, and transverse sulcation of its lower surface. Fig. 1*e*, jaws, natural size. Figs. 1*f*, 1*g*, 1*h*, 1*i*, 1*k*, five thoracic legs, natural size. Figs. 1*l*, 1*m*, 1*n*, 1*o*, four swimmerets of abdominal segments, twice the natural size. Figs. 2, 2*a*, 2*b*, 2*c*, swimmerets of female, twice the natural size.

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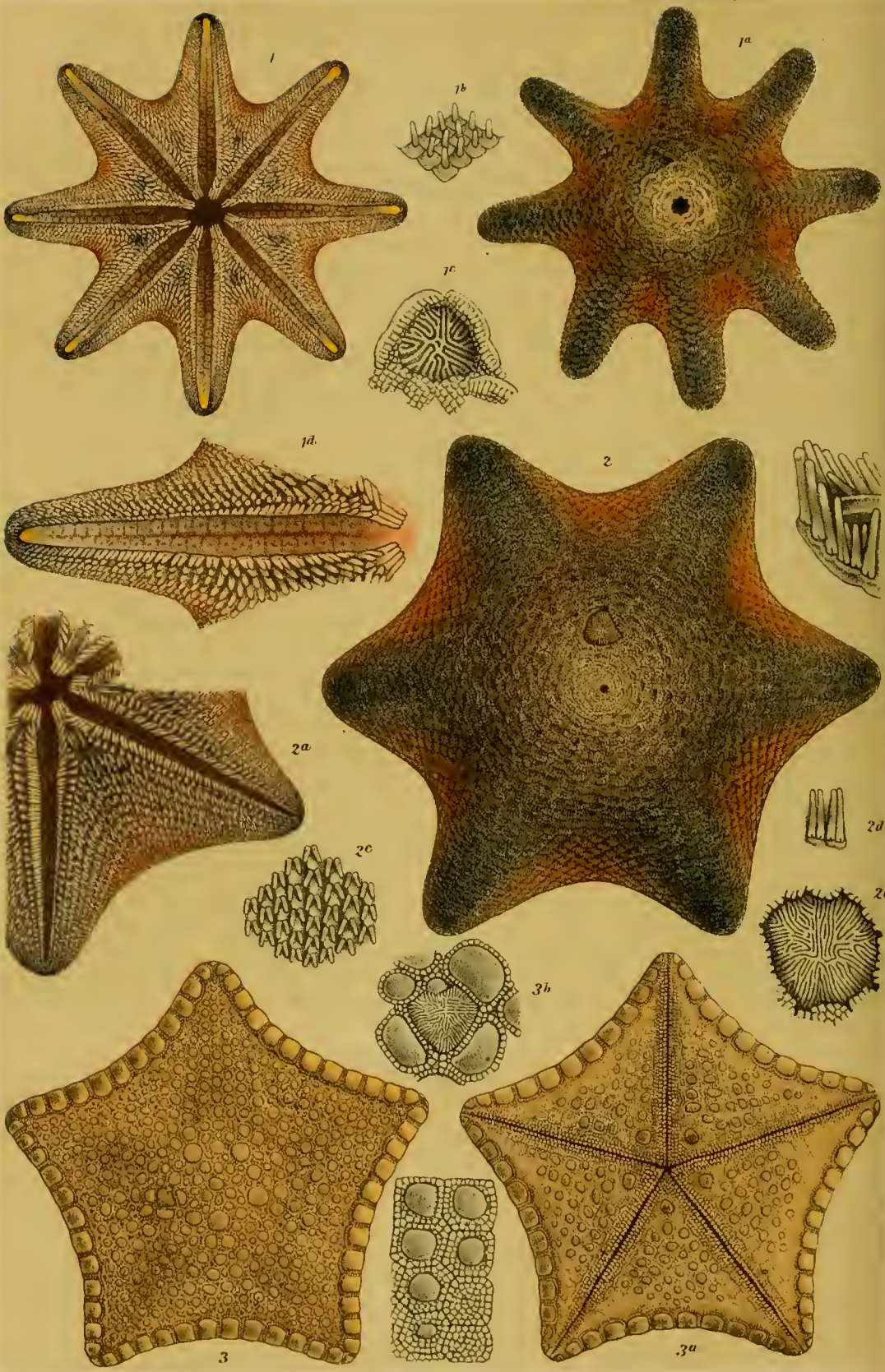

Dr Wild del. & lith.

Prof. M.c Coy direx.t

Steam Litho Govt Printing Office

PLATE 200, FIG. 1.

ASTERINA CALCAR (LAM. RESTRICTED BY GRAY).

THE EIGHT-RAYED CUSHION STARFISH.

[Genus ASTERINA (NARDO). (Sub-kingdom Radiata. Class Echinodermata. Order Asteroidea. Family Asterinidæ. Sub-family Asterininæ.)

Gen. Char.—Body tumid, with five to eight short blunt rays, back convex; oral surface flat or concave. Ossicula of each surface with one or more mobile tapering spines; edge sharp, with very minute marginal plates. Each of the ossicula of upper surface cresent-shaped, with a marginal series of very short spines; ambulacral spines in groups of two or five.]

DESCRIPTION.—Very gibbous, with eight short, nearly parallel-sided rays abruptly bluntly rounded at the tip; taking centre of mouth to tip of rays as 100, to middle of intervening margin, $\frac{60}{100}$. Adambulacral plates bordering ambulacral, each with two spines. Interambulacral plates between ambulacra on lower or oral side, each forming a broad slightly radiated base to a large, tapering, single spine. Plates of upper or dorsal surface thick, crescent-shaped, with from six to twenty minute spines fringing the convex edge of each in one or more rows. There are six long, slender, tapering spines to each of the large, interambulacral, trigonal oral plates, forming groups round the mouth; the middle pair longest, the others gradually diminishing to outer ones. Madreporiform tubercle subtrigonal. *Colour:* Very irregularly varied in different individuals, with usually the rays dull purple, mottled with darker, and more or less of dull red towards margin between the rays; others have these positions of the red and purple reversed; others are uniform rich purple above. Underside pale flesh-colour, with occasional pale purplish portions. *Measurements:* Diameter of ordinary specimen from tip to tip of rays, 2 in. 6 lines; from edge to opposite edge between rays, 1 in. 6 lines; depth, 6 lines.

REFERENCE.— = *Asterias calcar*, var. *C. octogona*, Lam. Anim. sans vert., v. 2, p. 557.

This is the commonest of all the Starfishes on the coast; adhering to stones below low-water mark. It is extremely variable in the extent and intensity of the purple on upper surface. The whitish central patch in the specimen figured is very unusual. It is easily distinguished from the almost equally common *A. Gunni*, by having eight longer and more parallel-sided rays, and by having a single spine on each of the inter-ambulacral plates between the ambulacra below.

Some specimens are of the rare diameter from tip to tip, of three and a half inches; and one specimen has only seven rays. On some specimens some of the plates of the row of adambulacral plates bordering the ambulacra seem to have only one spine, instead of the usual two; this is however abnormal, and two spines to each base is nearly constant.

The specimen figured is from Brighton Beach.

Explanation of Figures.

Plate 200.—Fig. 1, average specimen, natural size, viewed from below, showing long-spined, interambulaeral mouth plates and single-spined interambulaeral plates. Fig. 1*a*, same, viewed from above, showing madreporiform tuberele and erescentic spiuulose plates. Fig. 1*b*, single-spined, large-based interambulacral plates of lower or oral side, magnified three diameters. Fig. 1*c*, madreporiform tuberele, magnified four diameters. Fig. 1*d*, portion of underside, magnified two diameters, showing two spines to each ambulacral plate, and the single spine of each interambulacral plate.

Plate 200, Fig. 2.

ASTERINA GUNNI (Gray).

Gunn's Cushion Starfish.

Description.—Moderately tumid, depressed, with six very slightly projecting blunt rays and six slightly concave intervening sides; taking from centre of mouth to tip of ray as 100, from same point to middle of intervening margin, $\frac{75}{100}$. Inter-ambulacral plates on greater part of lower or oral side each with two divaricating, short spines; one or two rows of plates next the ambulacra, each with one single, larger spine; adambulacral plates in some individuals with two, in others with three spines each. Thick crescentiform plates of upper surface each with very numerous, small spinules. Madreporiform tubercle large, subtrigonal. Ten or twelve slender spines on each of the trigonal interambulacral oral plates. *Colour:* Generally purple above, sometimes with reddish between the rays; flesh colour below, with purplish along sides of ambulacra and round mouth. *Measurements:* Diameter of ordinary specimen, from tip to tip of rays, 3 in. 6 lines; to opposite edges of intervening margin, 2 in. 6 lines.

References.—*Asterias calcar*, var. *b*, Lamarck, Hist. Nat. A.S.V., vol. 2, p. 557; = *Asterina Gunni*, Gray, Ann. and Mag. Nat. Hist., 1840, vol. 6, p. 289.

This species is rather larger, broader, and flatter than *A. calcar*, with only six, less defined rays, scarcely projecting beyond the only slightly indented or moderately concave intervening sides, and is further easily distinguished by the two spines, instead of one, on all the middle interambulacral ossicles below. It inhabits the same parts of the shore as *A. calcar*, but is not quite so common.

EXPLANATION OF FIGURES.

PLATE 200.—Fig. 2, ordinary specimen, viewed from above, natural size, showing spinulose crescentiform plates. Fig. 2*a*, portion of underside, natural size, showing the pair of diverging spines on all the middle interambulacral plates, and the marginal row next the adambulacral plates with single larger spine, and pairs of more slender adambulacral spines, and the groups of longer spines on the oral plates. Fig. 2*b*, madreporiform tubercle, magnified three diameters. Fig. 2*c*, median interambulacral plates, each with its pair of diverging spines, magnified three diameters. Fig. 2*d*, pairs of spines on adambulacral plates, magnified three diameters. Fig. 2*e*, group of ten spines on edge of one of the six interambulacral oral plates.

PLATE 200, FIG. 3.

PENTAGONASTER (TOSIA) AURATA (GRAY).

THE TWELVE-PLATED SHIELD-STAR.

[Genus TOSIA (GRAY). (Sub-kingdom Radiata. Class Echinodermata. Order Asteroidea Family Pentagonasteridæ. Sub-family Pentagonasterinæ.)

Gen. Char.—Body flat, pentagonal, sides approximately rectilinear, slightly concave between the blunt tips of the rays. Two rows of marginal plates, few, smooth, with one row of granules on edge; abactinal or dorsal area and interambulacral plates below covered with rounded or polygonal smooth or granulated plates. Ambulacra margined by three or four rows of short spinules. Anal aperture very minute on right posterior edge of dorsocentral plate when madreporite is placed in upper right-hand interradium.]

DESCRIPTION.—Sides gently concave. Dorsal plates flat, irregularly polygonal, rounded, close, each with one row of blunt granules round the edge; three or five rows running to the angles slightly larger and more regularly hexagonal than the intervening ones; all diminishing towards the margins; closely touching, especially below; four basilar ones near the middle larger than the rest, one opposite the middle of each side, but the fifth, near the madreporite, not conspicuous. Madreporiform tubercle subtrigonal, the angles truncated, entirely covered with minute

vermicular and branched ridges, situated at about one third the distance from the centre to the margin. Marginal plates flattened, only slightly convex, with one row of granules round each; plates rather larger at middle of sides than at salient angles or tip of rays, twelve to fourteen above, and twelve to sixteen below from tip to tip of rays; one small odd plate in middle above. Oral actinal or under-plates closely touching, generally covered completely with granules, but some few with smooth central portion, with one, two, or three rows of granules on margin; two rows of blunt spines and two rows of granules larger than the rest bordering the ambulacra on each side (two compressed blunt spines on inner face of each adambulacral plate, and two shorter behind them). The five triangular mouth plates are bordered with spines like those of the adambulacral plates, within which are thick prismatic granules. From mouth to tip of ray (R), taken as 100, from same point to middle of side (r), $\frac{65}{100}$ to $\frac{70}{100}$; average diameter, 2 in. 6 lines. *Colour:* Often rich yellowish orange ("old gold"), more commonly clouded more or less with dull purple.

Reference.—P.Z.S., 1847, p. 80; Gray, Synop. sp. St., t. 16, f. 2.

The genus *Tosia* of Gray, taken as a sub-genus of *Pentagonaster* by Perrier, and merged into that genus by Sladen, is a convenient group or subdivision of the larger genus, which I think may advantageously be continued.

The Shield-Stars, as the flattened pentagonal Starfishes with large marginal plates and no projecting rays are called, are common on our shores, two species of the present genus being abundant under stones a little below low-water mark in Hobson's Bay, and along the rocky outer shores, the present species being distinguished from *T. Australis*, by its more numerous and flatter marginal plates (only six in *T. Australis*) and the greater number of plates below being covered with granules; some specimens having all on the actinal side granulate, and others having few or many smooth in the middle, with one, two, or three rows of granules round the margin. There are usually twelve marginal plates above and below on each side between the points of the ambulacra, and where they are more numerous the additional plates near the apices, are much smaller than the others; the plates towards the middle of the sides are always perceptibly larger than those near the angles.

I note that M. Perrier in the "Annales des Sciences Naturelles" for 1885, finds the marginal plates varying from eight to fourteen in his *Pentagonaster Gosselini* and this agrees with my experience of this present species, showing that the character varies more

than has usually been allowed for. In that species, Perrier counts usually ten. The usual number is of course a valuable character when combined with some other peculiarity.

I have not observed any pedicellariæ in this species.

Explanation of Figures.

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Frederick McCoy.

By Authority: Robt. S. Brain, Government Printer, Melbourne.

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,, *Lepralia*, I., 36; *vide* Chorizopora.
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,, var. diadema, Microporella, I., 37; II., 175; *vide Lepralia canaliculata*.
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,, *concinna*, I., 89; *vide* C. pulchella.
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,, *Membranipora*, II., 106; *vide* Pyripora.
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,, Schizoporella, I., 35; *vide Lepralia*.
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,, *fistulosa*, var. Australis, I., 49; *vide* C. Australis.
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,, *Hassallii*, II., 148; *vide* Schismopora costazei.
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,, platalea, II., 148, 168; *vide* Schismopora.
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,, *Tasmanicus*, I., 16, 17; *vide* Arripis truttaceus.
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,, *Emma*, I., 58; *vide* Menipea.
,, *Membranipora*, I., 25; *vide* Amphiblestrum.
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,, *Novæ Hollandiæ*, I., 92, 93; *vide* C. longicollis.
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,, *Australis*, II., 112; *vide* Callorhynchus Antarcticus.
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,, *dædala*, II., 108; *vide* C. Cordieri.
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,, vittata, I., 36; *vide Lepralia*.
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,, Great Green, I., 50.
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,, *olivacea*, I., 50; *vide* Cyclochila Australasiæ.
cidaris, Cellepora, II., 165.
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ciliata, Bicellaria, I., 59.
,, *Lepralia*, I., 37; II., 175; *vide* Microporella.
ciliata, *Membranipora*, I., 25; II., 127; *vide* Amphiblestrum ciliatum.
ciliata, Microporella, I., 37; II., 175; *vide Lepralia*.
,, var. personata, Microporella, I., 37; II., 175; *vide Lepralia*.
,, var. spicata, Microporella, I., 37; II., 175; *vide Lepralia*.
,, Sillago, II., 182.
ciliatum, Amphiblestrum, I., 25; II., 127; *vide Membranipora ciliata*.
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,, *Otaria*, I., 31, 71; *vide* Euotaria.
cinnamonicus, Tropinotus, II., 140; *vide* T. Australis.
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circinata, *Lepralia*, I., 35; *vide* Schizoporella.
,, Schizoporella, I., 35; *vide Lepralia*.
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,, geminata, I., 24; *vide Catenicella*.
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,, *Scomber*, II., 154; *vide* Cybium.
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,, Sand-Frog, I., 42.
concinna Catenicella, I., 89; *vide* C. pulchella.
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connexa, Amathia, II., 185; *vide* A. tortuosa.
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,, *Eucratea*, II., 108; *vide* Chlidonia Cordieri.
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,, Micropora, II., 196.
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,, *Testudo*, II., 101; *vide* Sphargis.
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,, Dimetopia, I., 46.
,, var. Schizoporella, II., 186; *vide* S. hyalina.
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,, *Cellepora*, II., 148, 168; *vide* Schismopora.
,, *Diachoris*, II., 117; *vide* Beania.
,, Schismopora, II., 148, 168; *vide Cellepora*.
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,, ,, Schismopora, II., 148; *vide Cellepora*.
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,, monoceros, I., 38; II., 187; *vide Lepralia*.
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,, *Diachoris*, II., 117; *vide* Beania.
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crystallina, *Lepralia*, I., 35; *vide* Schizoporella Cecilii.
crystallina, Menipea, I., 58.
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,, *Macquariensis*, I., 84; *vide* C. ambiguus.

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curtus; Hoplocephalus, I., 3.
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cyathus, Menipea, I., 58.
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,, *prælonga*, II., 116; *vide* C. longipora.
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,, *olivacea*, I., 50; *vide* C. Australasiæ.
Cyclodus *Boddaerti*, I., 72; *vide* C. gigas.
,, *fasciatus*, II., 171; *vide* C. occipitalis.
,, *flavigularis*, I., 72; *vide* C. gigas.
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dædala, Chlidonia, II., 108; *vide* C. Cordieri.
,, *Cothurnicella*, II., 108; *vide* C. Cordieri.
dædala, Schizoporella, II., 138.
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Datnia (?) ambigua, I., 84; *vide* Ctenolates ambiguus.
Dawsoni, Catenicella, I., 24; *vide* C. elegans.
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,, Loranthus, I., 8.
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,, *Catenicellopsis*, II., 107; *vide* Catenicella.
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,, *Grayi*, II., 153; *vide* D. Frazeri.
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,, *Eschara*, I., 48; *vide* Caleschara.
,, Flustra, I., 45.
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Dermochelys Atlantica, II., 101; *vide* Sphargis coriacea.
despecta, Entometa, I., 40; *vide* E. ignobilis.
Diachoris costata, II., 117; *vide* Beania.
,, Crotali, II., 117; *vide* Beania.
,, intermedia, II., 195; *vide* Beania.
Diachoris Magellanica, I., 46; *vide* Beania.
,, *patellaria*, II., 117; *vide* Amphiblestrum patellarium.
,, spinigera, I., 46; *vide* Beania.
diadema, Cellepora, II., 165.
,, *Lepralia*, I., 37; II., 175; *vide* Microporella canaliculata.
,, Microporella, I., 37; II., 175; *vide Lepralia*.
,, (var. canaliculata), Microporella, I., 37; II., 175; *vide Lepralia canaliculata*.
,, (var. lata), Microporella, I., 37; II., 175; *vide Lepralia*.
,, (var. longispina), Microporella, I., 37; II., 175; *vide Lepralia*.
,, (var. lunipuncta), Microporella, I., 37; II., 175; *vide Lepralia*.
diaphana, *Lepralia*, I., 35; *vide* Mucronella.
,, Mucronella, I., 35; *vide Lepralia*.
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,, *Flustrella*, II., 195; *vide* Verrucularia.
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,, cellulosa, I., 47; *vide* Adeona.
,, grisea, I., 66; *vide* Adeona.
,, Wilsoni, I., 67; *vide* Adeona.
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Diemenia aspidorhyncha, I., 23.
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,, superciliosa, I., 23.
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Dimetopia cornuta, I., 46.
,, hirta, II., 178.
,, spicata, I., 46.
Dinolestes Mülleri, II., 115; *vide* Lanioperca mordax.
Diplodactylus marmoratus, II., 132.
Discopora albirostris, II., 167; *vide* Cellepora.
dispar, Adeonella, I., 48; *vide Eschara*.
,, *Eschara*, I., 48; *vide* Adeonella.
,, *Membranipora*, I., 26; *vide* Thairopora.
,, Thairopora, I., 26; *vide Membranipora*.
dissimilis, Carbasea, I., 45.
distans, Hippothoa, II., 187.
,, Membraniporella, II., 187.
Diura roseipennis, I., 79; *vide* Acrophylla violascens.
divaricata, Hippothoa, II., 187.
Dog-Fish, Picked, I., 75.
Dolphin, Yellow-sided, I., 22.
dorsalis, *Cystignathus*, I., 42; *vide* Limnodynastes.
,, Limnodynastes, I., 42.
Dragon, Leafy Sea-, I., 65.
Dragonet, Crook-spined, II., 192.
Dules auratus, I., 84; *vide* Ctenolates ambiguus.
d'Urvillei,? Eudoxyla, I., 30; *vide* Zeuzera (Eudoxyla) Eucalypti.
Dusky Flat-horned Locust, II., 139.

E.

Earless Lizard, White-streaked, II., 181.
Eagle-Ray, Blue-spotted, I., 63.
Earth-Worm, Australian Giant, I., 7.
Echinorhinus *obesus*, II., 144; *vide* E. spinosus.
,, spinosus, II., 144.
Edwardsiana, Crisia, I., 39.
,, *Crisidia*, I., 39; *vide* Crisia.
Edwardsi, Palinurus, II., 149, 150; *vide* P. Lalandi.
Egernia Cunninghami, II., 141.
Eight-rayed Cushion Star-fish, II., 200.
Electra amplectens, II., 187.
,, flagellum, II., 106.
,, pilosa, I., 25; *vide Membranipora.*
elegaus, Carbasea, I., 45.
,, Catenicella, I., 24.
elegans, Eschara, I., 48; *vide* Lepralia quadrata.
elegans, Lepralia, I., 36.
elegans, Steganoporella, I., 60; *vide* S. magnilabris.
Elephant Fish, II., 112.
Ellerii *Lepralia*, I., 37; *vide* Mucronella.
,, Mucronella, I., 37; *vide Lepralia.*
elongata, Metura, I., 40.
elongatus, Oiketicus, I., 40; *vide* Metura elongata.
Emma cervicornis, I., 58; *vide* Menipea id.
Emys Macquaria, I., 82, 83; *vide* Chelymys.
Entometa *despecta*, I., 40; *vide* E. ignobilis.
,, ignobilis, I., 40.
Ephippitytha *maculata*, II., 120; *vide* Phaneroptera (Ephippitytha) trigintiduoguttata.
(Ephippitytha) trigintiduoguttata, Phaneroptera, II., 120.
episcopalis, *Carbasea*, I., 45; *vide* Euthyris.
,, Euthyris, I., 45; *vide Carbasea.*
Eschara denticulata, I., 48; *vide* Caleschara.
,, dispar, I., 48; *vide* Adeonella.
,, *elegans*, I., 48; *vide* Lepralia quadrata.
,, gracilis, I., 48; *vide* Porina.
,, mucronata, I., 48; *vide* Adeonellopsis.
,, obliqua, I., 48; *vide* Parmularia.
,, platalea, I., 48; *vide* Adeonella.
,, quadrata, I., 48; *vide* Lepralia.
Escharipora stellata, II., 175.
Esox saurus, II., 135; *vide* Scomberesox saurus, var. Forsteri.
eucalypti, Zeuzera (Eudoxyla), I., 30.
Eucratea chelata, II., 178; *vide* Scruparia.
,, Cordieri, II., 108; *vide* Chlidonia.
Eudoxyla, *d'Urvillei,?* I., 30; *vide* Zeuzera (Eudoxyla) Eucalypti.
(Eudoxyla) Zeuzera Eucalypti, I., 30.
Euotaria cinerea, I., 31, 71.
Euthyris episcopalis, I., 45; *vide Carbasea.*
excavata, *Lepralia*, I., 38; *vide* Mucronella.
,, Mucronella, I., 38; *vide Lepralia.*

F.

False Delma Lizard, Fischer's, II., 162.
falx, Trachypterus, II., 122; *vide* T. tænia.
Farcimia appendiculata, II., 178.
Farciminaria aculeata, II., 158.
Farciminaria dichotoma, II., 195; *vide* Verrucularia.
Farciminaria simplex, II., 158.
,, uncinata, II., 158.
farciminoides, Salicornaria, I., 49; *vide* Cellaria (*fistulosa*) Australis.
fasciatus, Cyclodus, II., 171; *vide* C. occipitalis.
Fasciculipora bellis, II., 157.
,, fruticosa, II., 157.
,, gracilis, II., 157.
,, ramosa, II., 157.
ferox, Hiantopora, I., 38; *vide Lepralia.*
,, *Lepralia*, I., 38; *vide* Hiantopora.
Festra affabricata, II., 197; *vide* Chelepteryx Collesi.
Fischer's False Delma Lizard, II., 162.
Fish, Angel, I., 34.
,, Australian Rough, II., 114.
,, Banks' Oar-, II., 145.
,, Bleeker's Parrot-, II., 134.
,, Craw-, Sydney, II., 159.
,, Craw-, Melbourne, II., 149, 150.
,, Cray-, Yabber or Yabbie, I., 29.
,, ,, Yarra Spiny, II., 160.
,, Cuttle-, Australian Tooth-cupped, I., 76, 77.
,, ,, Gould's Squid, II., 169, 170.
,, ,, Large Melbourne Sepia, or, II., 188, 189, 190.
,, Dog-, Picked, I., 75.
,, Elephant, II., 112.
,, Gar-, Black-finned Half-beak, or Sea, II., 135.
,, Oar-, Banks', II., 145.
,, Parrot-, Bleeker's, II., 134.
,, ,, Broad-striped, or Senator, II., 163.
,, Ribbon-, Southern Silver, II., 122.
,, Rough-, Australian, II., 114.
,, Saw-, Common Australian, I., 56.
,, Star-, Eight-rayed Cushion, II., 200.
,, ,, Gunn's Cushion, II., 200.
,, ,, Twelve-plated Shield, II., 200.
,, Toad-, Two-pronged, II., 123.
,, Yarra Spiny Cray-, II., 160.
fissa, Retepora, I., 94, 95.
fistulosa, *var.* Australis, Cellaria, I., 49; *vide* C. Australis.
flagellum, Electra, II., 106.
flagellum, Hippothoa, II., 187; *vide* H. distans.
flagellum, Hoplocephalus, I., 11.
,, *Membranipora*, II., 106; *vide* Electra.
Flat-horned Locust, Dusky, II., 139.
flavigularis, Cyclodus, I., 72; *vide* C. gigas.
Flemingii, Amphiblestrum, II., 106.
florea, Spiralaria, I., 46.
Flosculipora pygmæa, II., 176.
Flustra denticulata, I., 45.
Flustra Lacroixii, I., 26; *vide* Membranipora.
,, *lineata*, I., 26; II., 127; *vide* Membranipora pyrula.
,, membranacea, I., 25; *vide* Membranipora.
,, *membraniporides*, II., 177; *vide* Craspedozoum roboratum.
,, pilosa, I., 25; *vide* Electra.
Flustrella dichotoma, II., 195; *vide* Verrucularia.
foliacea, Hornera, II., 118.
,, *Retihornera*, II., 118; *vide* Hornera.
foliata, Cellepora, II., 166, 168.
foliatus, Phyllopteryx, I., 65.

foliatus, *Syngnathus*, I., 65; *vide* Phyllopteryx.
formosa, Catenicella, I., 24.
,, Retepora, I., 94,97.
Forsteri, Scomberesox saurus, var., II., 135.
fragilis, Biflustra, I., 57; *vide* B. perfragilis.
Frazeri, Delma, II., 153.
Frazer's Delma, II., 153.
Frog, Common Sand-, I., 42.
,, Green and Golden Bell-, I., 53.
,, Spotted Marsh-, I., 42.
fruticosa, Fasciculipora, II., 157.
funiculata, Menipea, II., 177.
Furina bicucullata, I., 32.
Furina-Snake, Two-hooded, I., 32.
Fur-Seal or Sea-Bear, I., 31, 71.
fusca, Catenicella, I., 90.
,, Cellepora, II., 167, 168.

G.

Gadopsis gibbosus, I., 27.
,, gracilis, I., 27.
Galeus Australis, I., 64.
Gar-Fish, Black-finned Half-beak, or Sea, II., 135
Gasterosteus saltatrix, II., 183; *vide* Temnodon saltator.
gastrosticta, Hinulia, II., 191; *vide* H. Quoyi.
Gecko, Marbled, II., 132.
,, Thick-tailed, II., 132.
gemella, Catenicella, II., 146.
Gemellipora striatula, II., 138.
geminata, *Catenicella*, I., 24; *vide* Claviporella.
,, Claviporella, I., 24; *vide Catenicella*.
,, Stomatopora, II., 176.
Genypterus Australis, I., 27.
,, *blacodes* (?), I., 27; *vide* G. Australis.
,, *tigerinus*, I., 27; *vide* G. Australis.
Georgianus, Arripis, II., 184.
,, *Centropristes*, II., 184; *vide* Arripis.
Giant Earth-Worm, Australian, I., 7.
Gibbose Blackfish, I., 27.
gibbosus, Gadopsis, I., 27.
gigas, *Cancer*, II., 179, 180; *vide* Pseudocarcinus.
,, Cyclodus, I., 72.
,, Pseudocarcinus, II., 179, 180.
,, *Scincus*, I., 72; *vide* Cyclodus.
Gippslandica, Perichæta, I., 7.
Gippsland Perch, I., 14.
,, Water-Lizard, I., 81.
Girella simplex, I., 73.
glabra, *Bicellaria*, II., 195; *vide* Stirparia.
,, Caberea, II., 137.
,, Stirparia, II., 195.
Glesne, Regalecus, II., 145; *vide* R. Banksi.
glomerata, *Cellepora*, II., 148, 168; *vide* Schismopora.
,, Schismopora, II., 148, 168; *vide Cellepora*.
glycine, Agarista, I., 8.
,, *Phalænoides*, I., 8; *vide* Agarista.
Goat Moth, Large Wattle, I., 30.
Golden Bell-Frog, Green and, I., 53.
,, Perch, Murray, I., 84.
Goniocidaris tubaria, I., 100.
Gouldi, *Hydrosaurus*, II., 151; *vide* Monitor.
,, Monitor, II., 151.
Gouldi, Ommastrephes, II., 169, 170.
Gould's Monitor Lizard, II., 151.
,, Squid, II., 169, 170.
gracilenta, Catenicella, II., 146.
gracilis, Cellaria, I., 49.
,, *Eschara*, I., 48; *vide* Porina.
,, Fasciculipora, II., 157.
,, Gadopsis, I., 27.
,, Porina, I., 48; *vide Eschara*.
,, *Salicornaria*, I., 49; *vide* Cellaria.
Grammatophora barbata, II., 121.
,, muricata, II., 111.
,, *vide Amphibolurus*.
grandis, Bicellaria, I., 59.
,, Caberea, II., 136.
grandis, Seriola, II., 172; *vide* S. Lalandi.
granulata, Retepora, I., 94, 99.
Grasshopper, Great Green Gum-tree, II., 109.
,, Smaller Green Gum-tree, II., 119.
,, Thirty-two Spotted, II., 120.
Grayi, Delma, II., 153; *vide* D. Frazeri.
Great Black, or Manna Cicada, I., 50.
,, Green Cicada, I., 50.
,, Green Gum-tree Grasshopper, II., 109.
,, Red King-Crab, II., 179, 180.
Green and Golden Bell-Frog, I., 53.
,, Cicada, Great, I. 50.
,, Cicada, Great Black or Manna, I., 50.
,, Gum-tree Grasshopper, Great, II., 109.
,, Gum-tree Grasshopper, Smaller, II., 119.
Grilli, *Gymnetrus*, II., 145; *vide* Regalecus Banksi.
grisea, Adeona, I., 66; *vide Dictyopora*.
,, *Dictyopora*, I., 66; *vide* Adeona.
Gryllus Australis, II., 140; *vide* Tropinotus.
,, *musicus*, II., 110; *vide* Œdipoda musica.
,, *pictus*, II., 110; *vide* Œdipoda musica.
Grystes Macquariensis, I., 85, 86; *vide* Oligorus.
,, *Peeli*, I., 85, 86; *vide* Oligorus Macquariensis.
Gum-tree Grasshopper, Great Green, II., 109.
,, ,, Smaller Greeu, II., 119.
Gunneri, Cetorhinus, II., 104; *vide* C. maximus.
Gunni, Asterina, II., 200.
Gunn's Cushion Star-fish, II., 200.
Gurnard, Spiny-sided Butterfly, I., 5.
,, Kumu, I., 6.
Gurnet-Perch, Banded Red, I., 33.
,, Spotted Red, II., 193.
Gymnetrus Banksi, II., 145; *vide* Regalecus.
,, *Grilli*, II., 145; *vide* Regalecus Banksi.
,, *Hawkinsi*, II., 145; *vide* Regalecus Banksi.
Gymnobelideus Leadbeateri, I., 91.

H.

Half-beak or Sea Garfish, Black-finned, II., 135.
Hammer-headed Shark, I., 56.
Hannafordi, Catenicella, I., 24.
Harpalyce, *Papilio*, I., 9; *vide* Pieris (Thyca)
,, Pieris (Thyca), I., 9.
Hassallii, *Cellepora*, II., 148; *vide* Schismopora Costazei.
hastata, Catenicella, I., 24.
Hawkinsi, *Gymnetrus*, II., 145; *vide* Regalecus Banksi.

Hemiramphus intermedius, II., 135.
,, *melanochir*, II., 135; *vide* H. intermedius.
heptacanthus, *Chilodipterus*, II., 183; *vide* Temnodon saltator.
,, Temnodon, II., 183; *vide* T. saltator.
(Heptanchus) Notidanus Indicus, I., 43.
Heterodontus Phillipi, II., 113.
Heteroscarus Macleayi, II., 164.
heterurus, *Amphibolurus*, I., 81; *vide* Physignathus Lesueri, var. Howitti.
Hiantopora ferox, I., 38; *vide Lepralia*.
Hinulia *gastrosticta*, II., 191; *vide* H. Quoyi.
,, Lizard, Quoy's, II., 191.
,, ,, White's, II., 191.
,, Quoyi, II., 191.
,, Whitei, II., 191.
Hippocampus breviceps, I., 65.
hippocrepis, *Balistes*, II., 125; *vide* Monacanthus.
,, Monacanthus, II., 125.
Hippothoa catenularia, II., 106; *vide* Pyripora.
,, *crassa*, II., 106; *vide* Pyripora.
Hippothoa distans, II., 187.
,, divaricata, II., 187.
,, *flagellum*, II., 187; *vide* H. distans.
,, *Patagonica*, II., 187; *vide* H. divaricata.
hirsuta, Cellaria, I., 49.
,, *Onchopora*, I., 49; *vide* Tubucellaria.
,, *Salicornaria*, I., 49; *vide* Cellaria.
,, Tubucellaria, I., 49.
hirta, Dimetopia, II., 178.
Homianus, Cetorhinus, II., 104; *vide* C. maximus.
Hooded Furina-Snake, Two-, I., 32.
Hoplocephalus coronoides, I., 11.
,, curtus, I., 3.
,, flagellum, I., 11.
,, superbus, I., 2.
Hornera foliacea, II., 118.
,, robusta, II., 118.
Horse Mackerel, I., 18.
Horse-shoe-marked Leather-Jacket, II., 125.
Horse, Sea-, Short-headed I., 65.
Hound, Australian Smooth-, I., 87.
Howitti, Physignathus Lesueri, var., I., 81.
Hügeli, Palinurus, II., 159.
hyalina, *Lepralia*, I., 38; II., 186; *vide* Schizoporella hyalina, var. pellucida.
,, var. pellucida, Schizoporella, I., 38; II., 186; *vide Lepralia* hyalina.
Hydraspis Australis, I., 82, 83; *vide* Chelymys Macquaria.
Hydrosaurus Gouldi, II., 151; *vide* Monitor.
Hydrosaurus varius, I., 41.
Hyla Jacksoniensis, I., 53; *vide* Ranoidea aurea.
Hysteropus Novæ Hollandiæ, II., 152, 153; *vide* Pygopus lepidopus.
hystrix, Lekythopora, II., 156.

I.

Ibacus Crab, Péron's, II., 199.
,, *incisus*, II., 199; *vide* I. Peronii.
,, Peronii, II., 199.
Idmonea Australis, I., 68.
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,, radians, I., 68.
ignobilis, Entometa, I., 40.
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impar, Pseudodelma, II., 162.
imperforata, Claviporella, II., 146.
inarmata, Amathia, II., 185.
,, Membranipora, II., 127.
incisus, Ibacus, II., 199; *vide* I. Peronii.
incrassata, var., Schizoporella, II., 186; *vide* S. hyalina.
Indicus, Notidanus (Heptanchus), I., 43.
indivisa, Carbasea, I., 45.
innominata, Cribrilina, II., 187; *vide* C. radiata.
intermedia, Beania, II., 195.
,, Catenicella, I., 24, 89.
,, Cellepora, II., 166.
,, *Diachoris*, II., 195; *vide* Beania.
intermedius, Hemiramphus, II., 135.
iodomus, Tropidoderus, I., 69, 70.
iris (?), Trachypterus, II., 122; *vide* T. tænia.
Istiurus Lesueri, I., 81; *vide* Physignathus.
Itea, Pyrameis, II., 198.

J.

Jacksoniensis, *Agama*, II., 111; *vide* Grammatophora muricata.
,, *Hyla*, I., 53; *vide* Ranoidea aurea.
,, Ranoidea, I., 53; *vide* R. aurea.
Jervoisii, *Steganoporella*, II., 196; *vide* Thairopora.
,, Thairopora, II., 196.
Jew Lizard, II., 121.

K.

Keel-backed Locust, Cinnamon, II., 140.
Kershawi, *Cynthia*, II., 198; *vide* Pyrameis.
,, Pyrameis, II., 198.
King-Crab, Great Red, II., 179, 180.
Kumu Gurnard, I., 6.
,, Trigla, I., 6.

L.

Labrichthys Bleekeri, II., 134.
,, laticlavius, II., 163.
Lace Lizard, I., 41.
Lacerta muricata, II., 111; *vide* Grammatophora.
,, *sincoides*, I., 72; *vide* Cyclodus gigas.
,, *varia*, I., 41; *vide* Hydrosaurus varius.
Lacroixii (?), *Flustra*, I., 26; *vide* Membranipora id.
,, Membranipora, I., 26.
lævis, Catenicella, var., I., 24; *vide* C. plagiostoma.
,, Mucronella, II., 116.
Lagenipora nitens, II., 156.
,, tuberculata, II., 156.
Lalandi, Palinurus, II., 149, 150.
,, Seriola, II., 172.
lamia, Carcharodon, I., 74; *vide* C. Rondeletii.
Lanioperca mordax, II., 115.
Laplacei, *Saturnia*, II., 197; *vide* Chelepteryx Collesi.

Large Melbourne Sepia, or Cuttle-Fish, II., 188, 189, 190.
,, Pink-winged Phasma, I., 80.
,, Wattle Goat-Moth, I., 30.
larvalis, *Lepralia*, I., 37; *vide* Porina.
,, Porina, I., 37; *vide Lepralia*.
lata, var. diadema, Microporella, II., 175.
,, Schizoporella, II., 138.
Lates colonorum, I., 14.
,, antarcticus, I., 14.
laticlavius, Labrichthys, II., 163.
latisinuata, Schizoporella, II., 186.
latistylus, Mantis, II., 130.
(laxa, var.) Retepora porcellana, I., 94, 95.
Leadbeateri, Gymnobelideus, I., 91.
Leafy Sea-Dragon, I., 65.
Leather-Jacket, Brown's Tooth-brush, II., 124.
,, Horse-shoe-marked, II., 125.
,, Péron's, II., 143.
Leathery Turtle, or Luth, II., 101.
Lekythopora hystrix, II., 156.
Leopard Seal, Sea-, I., 21.
lepidopodus, Bipes, II., 152, 153; *vide* Pygopus lepidopus.
lepidopus, Pygopus, II., 152, 153.
Lepidotrigla Vanessa, I., 5.
Lepralia anceps, I., 35.
Lepralia Botryoides, I., 38; *vide* Schizoporella.
,, Brogniartii, I., 36; *vide* Chorizopora.
,, canaliculata, I., 37; II., 175; *vide* Microporella diadema, var. canaliculata.
,, Cecilii, I., 35; *vide* Schizoporella.
,, (*Cellepora*) megasoma, I., 38; II., 148, 168; *vide* Schismopora.
,, ,, tiara, II., 148, 168; *vide* Schismopora.
,, ,, vitrea, I., 38; II., 148, 168; *vide* Schismopora.
Lepralia, cheilodon, I., 37.
Lepralia ciliata, I., 37; II., 175; *vide* Microporella.
,, circinata, I., 35; *vide* Schizoporella.
,, *crystallina*, I., 35; *vide* Schizoporella Cecilii, I., 35.
,, diadema, I., 37; II., 175; *vide* Microporella.
,, diaphana, I., 35; *vide* Mucronella.
Lepralia elegans, I., 36.
Lepralia Ellerii, I., 37; *vide* Mucronella.
,, excavata, I., 38; *vide* Mucronella.
,, ferox, I., 38; *vide* Hiantopora.
,, hyalina, I., 38; II., 186; *vide* Schizoporella hyalina, var. pellucida.
,, larvalis, I., 37; *vide* Porina.
,, longipora, II., 116; *vide* Cyclicopora.
,, *lunata*, I., 36; II., 175; *vide* Microporella diadema.
,, magnirostris, II., 175; *vide* Tessaradoma.
,, Malusii, I., 36; II., 175; *vide* Microporella.
,, Maplestonei, I., 35; *vide* Schizoporella.
,, marsupium, I., 35; *vide* Porella.
,, monoceros, I., 38; II., 187; *vide* Cribrilina.
,, mucronata, I., 48; *vide* Adeonellopsis (*Eschara*).
Lepralia Pallasiana, I., 36; *vide* L. *pertusa*.
Lepralia papillifera, I., 37; *vide* Porella.
,, pellucida, I., 38; II., 186; *vide* Schizoporella hyalina, var. pellucida.
Lepralia *pertusa*, I., 36; *vide* L. Pallasiana.
,, quadrata, I., 48; *vide Eschara*.
Lepralia schizostoma, I., 38; *vide* Schizoporella.
,, striatula, II., 138; *vide* Gemellipora.
,, subimmersa, I., 35; *vide* Schizoporella.
,, trifolium, I., 37; *vide* Amphiblestrum.
,, vittata, I. 36; *vide* Chorizopora.
leptonyx, *Phoca*, I., 21; *vide* Stenorhynchus.
,, Stenorhynchus, I., 21.
leptorhyncha, Lialis, II., 161; *vide* L. Burtoni.
Lesueri, Physignathus, var. Howitti, I., 81.
,, *Istiurus*, I., 81; *vide* Physignathus.
,, *Lophura*, I., 81; *vide* Physignathus.
leucopsis, Tiliqua, II., 191; *vide* Hinulia Whitei.
Lewini, Agarista, I., 8.
Lewin's Day-Moth, I., 8.
Lialis *bicatenata*, II., 161; *vide* L. Burtoni.
,, Burtoni, II., 161.
,, Burton's, II., 161.
,, *leptorhyncha*, II., 161; *vide* L. Burtoni.
,, Lizard, Burton's, II., 161.
,, *punctulata*, II., 161; *vide* L. Burtoni.
Lichenopora bullata, II., 176.
,, magnifica, II., 176.
Lictor Case-Moth, I., 40.
ligulatum, Craspedozoum, II., 177.
Limnodynastes dorsalis, I., 42.
,, Tasmaniensis, I., 42.
lineata Membranipora, I., 26; II., 127; *vide* M. pyrula.
,, *Flustra*, I., 26; II., 127; *vide* Membranipora pyrula.
lineata, Tympanocryptis, II., 181.
Ling, Australian Rock, I., 27.
Lined Aprasia Lizard, II., 162.
lineo-guttatus, Monacanthus, II., 124; *vide* M. Browni.
lipped Snake, White-, I., 11.
lirata, Cellepora, II., 167, 168.
Little Whip-Snake, I., 11.
Lizard, Aprasia, Lined, II., 162.
,, Bearded, II., 121.
,, Blood-sucker, II., 111.
,, Blue-tongue, Sleepy or Northern, I., 72.
,, ,, Southern or Blotched, II., 131.
,, Broad-banded or Occipital Blue-tongue, II., 171.
,, Burton's Lialis, II., 161.
,, Delma, Fischer's False, II., 162.
,, ,, Iguana, I., 41.
,, Gippsland Water Lizard, I., 81.
,, Gould's Monitor, II., 151.
,, Hinulia, Quoy's, II., 191.
,, ,, White's, II., 191.
,, ,, Frazer's, II., 153.
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,, Jew, II., 121.
,, Lace, I., 41.
,, Lined Aprasia, II., 162.
,, Monitor, Gould's, II., 151.
,, *Muricated*, II., 111; *vide* Blood-sucker.
,, Northern Blue-tongued, I., 72.

Lizard, Pygopus, II., 152, 153.
,, Quoy's Hinulia, II., 191.
,, Shingle-back, Rugged Stump-tail, or, II., 102.
,, Sleepy, Northern Blue-tongue, or, I., 72.
,, ,, Southern Blotched Blue-tongue, or, II., 131.
,, Southern, or Blotched Blue-tongue, II., 131.
,, Spiny-ridged, II., 141.
,, Stump-tail, Rugged, or Shingle Back, II., 102.
,, Water-, Gippsland, I., 81.
,, White's Hinulia Lizard, II., 191.
,, White-streaked Earless, II., 181.
lobatus, Squalus, I., 43; *vide* Crossorhinus barbatus.
Lobster, Murray, I., 15.
,, Southern Rock, II., 149, 150.
,, Southern Spiny (Melbourne Craw-fish), II., 149, 150.
,, Sydney Spiny, or Sydney Craw-fish, II., 159.
Locust, Australian Yellow-winged, II., 110.
,, Cinnamon Keel-backed, II., 140.
,, Dusky Flat-horned, II., 139.
,, Pedestrian Mid-eyed, II., 139.
Locusta vigentissima, II., 109.
Long-fingered Chilodactylus, II., 173, 174.
longicollis, Chelodina, I., 92, 93.
,, *Testudo*, I., 92, 93; *vide* Chelodina.
longipora, Cyclicopora, II., 116.
,, *Lepralia*, II., 116; *vide* Cyclicopora.
longirostris, Rhynchopora, II., 196.
(longispina, var.), diadema, Microporella, II., 175.
Long-necked River Tortoise, I., 92, 93.
Long-tailed Shark, Thresher or, I., 88.
Long-toothed Bull Shark, or Shovel-nosed Shark, I., 64.
Lophura, Istiurus, I., 81; *vide* Physignathus Lesueri, var. Howitti.
,, Lesueri, I., 81; *vide* Physignathus Lesueri, var. Howitti.
Loranthus Day-Moth, I., 8.
lorica, Catenicella, I., 24.
Lotella callarias, I. 19.
lucida, Callymmophora, II., 105; *vide* Urceolipora nana.
Ludrick, I., 73.
lunata, Lepralia, I., 36; II., 175; *vide* Microporella diadema.
lunata (var.), Retepora monilifera, form munita, I., 94, 96.
(lunipuncta, var.), diadema, Microporella, II., 175.
Luth, or Leathery Turtle, II., 101.
Lygosoma molinigera, II., 191; *vide* Hinulia Whitei.
,, Quoyi, II., 191, *vide* Hinulia.
lyra, Testudo, II., 101; *vide* Sphargis coriacea.

M.

Maccoyi, Thynnus, I., 44; *vide* T. thynnus.
Mackerel, Commerson's, II., 154.
,, Horse, I., 18.
,, Southern, I., 28.
Macquaria, Chelymys, I., 82, 83.
,, *Emys*, I., 82, 83; *vide* Chelymys.
,, *Platemys*, I., 82, 83; *vide* Chelymys.
Macquariensis, Ctenolates, I., 84; *vide* C. ambiguus.
Macquariensis, Oligorus, I., 85, 86.
,, *Grystes*, I., 85, 86; *vide* Oligorus.
Macleayi, Hetcroscarus, II., 164.
Macleay's Wrasse, II., 164.
maculata Ephippitytha, II., 120; *vide* Phaneroptera (Ephippitytha) trigintiduoguttata.
Magellanica, Beania, I., 46; *vide Diachoris*.
,, *Diachoris*, I., 46; *vide* Beania.
magnifica, Lichenopora, II., 176.
magnilabris, *Membranipora*, I., 60; *vide* Steganoporella.
,, Steganoporella, I., 60.
magnirostris Cellepora, II., 167, 168.
,, *Lepralia*, II., 175; *vide* Tessaradoma.
,, *Porina*, II., 175; *vide* Tessaradoma.
,, Tessaradoma, II., 175.
malleus, Zygæna, I., 56.
Malusii, *Lepralia*, I., 36; II., 175; *vide* Microporella.
,, Microporella, I., 36; II., 175; *vide Lepralia*.
,, var. personata, Microporella, II., 175; *vide Lepralia*.
,, var. thyreophora, Microporella, II., 175; *vide* Lepralia.
mamillaris, *Membranipora*, I., 25; II., 196; *vide* Thairopora.
,, Thairopora, I., 25; II., 196; *vide Membranipora*.
Manna Cicada, Great Black or, I., 50.
Mantis, Broad-styled, II., 130.
,, latistylus, II., 130.
Maplestonia cirrata, II., 126.
Maplestonei, *Lepralia*, I., 35; *vide* Schizoporella.
,, Schizoporella, I., 35; *vide Lepralia*.
Marbled Gecko, II., 132.
margaritacea, Catenicella, I., 24.
marginata, Perca, I., 16, 17; *vide* Arripis truttaceus.
marmoratus, Diplodactylus, II., 132.
Marsh-Frog, Spotted, I., 42.
marsupiata, Retepora, I., 94, 95; *vide* R. fissa.
marsupium, *Lepralia*, I., 35; *vide* Porella.
,, Porella, I., 35; *vide Lepralia*.
marsupium, Schizoporella, II., 138; *vide* S. Ridleyi.
maxima, Selache, II., 104; *vide* Cetorhinus maximus.
maximus, Cetorhinus, II., 104.
,, *Squalus*, II., 104; *vide* Cetorhinus.
Megascolides Australis, I., 7.
megasoma, *Cellepora (Lepralia)*, I., 38; II., 148, 168; *vide* Schismopora.
,, Schismopora, I., 38; II., 148, 168; *vide Cellepora (Lepralia)*.
melanochir, Hemiramphus, II., 135; *vide* H. intermedius.
Melbourne Crawfish, II., 149, 150.
,, Pelamyd, II., 155.
,, Sepia or Cuttle-Fish, Large, II., 188, 189, 190.

membranacea, *Flustra*, I., 25; *vide* Membranipora.
,, Membranipora, I., 25.
Membranipora *acifera*, II., 127; *vide* M. serrata.
Membranipora amplectens, II., 187; *vide* Electra.
,, bimamillata, II., 106; *vide* Biflustra.
,, catenularia, II., 106; *vide* Pyripora.
,, cervicornis, I., 25; *vide* Amphiblestrum.
,, *ciliata*, I., 25; II., 127; *vide* Amphiblestrum ciliatum
Membranipora corbula, II., 127.
Membranipora coriacea, II., 196; *vide* Micropora.
,, dispar, I., 26; *vide* Thairopora.
,, flagellum, II., 106; *vide* Electra.
Membranipora inarmata, II., 127.
,, Lacroixii (?), I., 26.
,, *lineata*, I., 26; II., 127; *vide* M. pyrula.
Membranipora magnilabris, I., 60; *vide* Steganoporella.
,, mamillaris, I., 25; II., 196; *vide* Thairopora.
Membranipora membranacea, I., 25.
Membranipora nitens, II., 106; *vide* Bathypora (*porcellana*) nitens.
,, papulifera, II., 106; *vide* Biflustra.
,, *patellaria*, II., 117; *vide* Amphiblestrum patellarium.
Membranipora pectinata, II., 127.
Membranipora perforata, I., 25, 36; *vide* Micropora.
,, *permunita*, II., 106; *vide* Amphiblestrum permunitum.
,, pilosa, I., 25; *vide* Electra.
,, polita, II., 106; *vide* Pyripora.
,, *porcellana*, II., 106; *vide* Bathypora nitens.
Membranipora pyrula, I., 26; II., 127; *vide* M. *lineata*.
Membranipora radicifera, II., 117; *vide* Beania.
,, *roborata*, II., 177; *vide* Craspedozoum roboratum.
,, *Rosselii*, I., 26; *vide* Amphiblestrum bursarium.
Membranipora serrata, II., 127.
,, spinosa, II., 127.
Membranipora umbonata, I., 26; *vide* Amphiblestrum umbonatum.
,, Woodsii, I., 26; *vide* Thairopora.
Membraniporella distans, II., 187.
membraniporides, *Flustra*, II., 177; *vide* Craspedozoum roboratum.
Menipea *benemunita*, (?) II., 177; *vide* M. funiculata.
,, Buskii, I., 58.
,, cervicornis, I., 58.
,, crystallina, I., 58.
,, cyathus, I., 58.
,, funiculata, II., 177.
,, tricellata, I., 58.
mercurialis, Sphargis, II., 101; *vide* S. coriacea.
mercurii, Sphargis, II., 101; *vide* S. coriacea.
Mesops pedestris, II., 139.
Metura elongata, I., 40.
microlepidota, Diemenia, I., 23.
Micropora coriacea, II., 196.
,, perforata, I., 25, 36; *vide Membranipora*.
Microporella canaliculata (var.), diadema, I., 37; II., 175; *vide Lepralia canaliculata*.
,, ciliata, I., 37; II., 175; *vide Lepralia*.
,, ,, var. personata, II., 175.
,, ,, ,, spicata, II., 175.
,, diadema, I., 37; II., 175; *vide Lepralia*.
,, ,, var. canaliculata, I., 37; II., 175; *vide Lepralia* canaliculata.
,, ,, ,, lata, II., 175.
,, ,, ,, longispina, II., 175.
,, ,, ,, lunipuncta, II., 175.
,, lata (var.), diadema, II., 175.
,, longispina (var.), diadema, II., 175.
,, lunipuncta (var.), diadema, II., 175.
,, Malusii, I., 36; II., 175; *vide Lepralia*.
,, ,, var. personata, II., 175.
,, ,, ,, thyreophora, II., 175.
,, renipuncta, II., 175.
,, scandens, II., 175.
Microporella stellata, II., 175; *vide* Escharipora.
Mid-eyed Locust, Pedestrian, II., 139.
Milesi, Aulopus, I., 54, 55; *vide* A. purpurisatus.
Miliusii, Phyllurus, II., 132.
Milneana, Idmonea, I., 68.
mirabilis, Beania, II., 116.
mœrens, Cicada, I., 50.
molinigera, *Lygosoma*, II., 191; *vide* Hinulia Whitei.
Mollia patellaria, II., 117; *vide* Amphiblestrum patellarium.
Möllerí, Delma, II., 153; *vide* D. Frazeri.
Monacanthus Browni, II., 124.
,, Hippocrepis, II., 125.
,, *lineoguttatus*, II., 124; *vide* M. Browni.
,, Peronii, II., 143.
monilifera, Retepora, I., 94, 96, 97.
,, ,, form munita, var. acutirostris, I., 94, 96.
,, ,, form munita, var. lunata, I., 94, 96.
,, ,, var. sinuata, I., 94, 96.
,, ,, form umbonata, I., 94, 97.
Monitor Gouldi, II., 151.
Monitor Lizard, Gould's, II., 151.
monoceros, Cribrilina, I., 38; II., 187; *vide Lepralia*.
,, *Lepralia*, I., 38; II., 187; *vide* Cribrilina.
mordax, Lanioperca, II., 115.
Morelia variegata, I., 13.
Moth, Goat-, Large Wattle, I., 30.
,, Lewin's Day-, I., 8.

Moth, Lictor Case-, I., 40.
,, Loranthus Day-, I., 8.
,, Saunders' Case-, I., 40.
,, Vine Day-, I., 8.
mucronata, Adeonellopsis, I., 48; *vide Eschara* (*Lepralia*).
,, *Eschara* (*Lepralia*), I., 48; *vide* Adeonellopsis.
,, *Lepralia*, I., 48; *vide* Adeonellopsis (*Eschara*).
Mucronella diaphana, I., 35; *vide Lepralia*.
,, Ellerii, I., 37; *vide Lepralia*.
,, excavata, I., 38; *vide Lepralia*.
,, lævis, II., 116.
,, *munita*, II., 116; *vide* M. tricuspis.
Mucronella pyriformis, II., 158; *vide* Bracebridgia.
Mucronella tricuspis, II., 116.
,, vultur, II., 116.
*Müller*i, *Dinolestes*, II., 115; *vide* Lanioperca mordax.
multiradiata, *Neosphyræna*, II., 115; *vide* Lanioperca mordax.
munita (form), Retepora monilifera, var. acutirostris, I., 94, 96.
,, (form), Retepora (monilifera, var. lunata). I., 94, 96.
munita, Mucronella, II., 116; *vide* M. tricuspis.
muricata, Grammatophora, II., 111.
,, *Lacerta*, II., 111; *vide* Grammatophora.
Muricated Lizard, II., 111; *vide* Grammatophora muricata.
Murray Cod-Perch, I., 85, 86.
,, Golden Perch, I., 84.
,, Lobster, I., 15.
,, Tortoise, I., 82, 83.
musica, Œdipoda, II., 110.
musicus, *Gryllus*, II., 110; *vide* Œdipoda musica.
Mustelus Antarcticus, I., 87.
Myliobatis Australis, I., 63.

N.

Naja Australis, II., 142; *vide* Pseudechys.
,, *curta*, I., 3; *vide* Hoplocephalus curtus.
nana, Urceolipora, II., 105.
Nautilus, Paper, or Tuberculated Argonaut, I., 61, 62.
Nellia oculata, I., 49.
Neosebastes scorpænoides, II., 193.
Neosphyræna multiradiata, II., 115; *vide* Lanioperca mordax.
neritina, Bugula, I., 59.
Netted Acripeza, II., 129.
nigrescens, *Anilios*, II., 103; *vide* Typhlops.
,, Typhlops, II., 103.
nigroluteus, Cyclodus, II., 131.
,, *Scincus*, II., 131; *vide* Cyclodus.
nitens, Bathypora, II., 106; *vide Membranipora* nitens and Bathypora *porcellana*.
,, Lagenipora, II., 156.
nodosa, Argonauta, I., 61, 62; *vide* A. oryzata.
Northern Blue-tongued Lizard, I., 72.
Notidanus (Heptanchus) Indicus, I., 43.
Novæ-Hollandiæ, Chelodina, I., 92, 93; *vide* C. longicollis.
,, *Hysteropus*, II., 152, 153; *vide* Pygopus lepidopus.
Novæ-Zealandiæ, Delphinus, I., 22.
nudipinnis, Pristiophorus, I., 56.

O.

Oar-Fish, Banks', II., 145.
obesus, Echinorhinus, II., 144; *vide* E. spinosus.
obliqua, *Eschara*, I., 48; *vide* Parmularia.
,, Parmularia, I., 48; *vide Eschara*.
obtecta, Scrupocellaria, II., 126.
Occipital Blue-Tongue Lizard, Broad-banded or, II., 171.
occipitalis, Cyclodus, II., 171.
octogona, *Asterias*, var., II., 200; *vide* Asterina calcar.
octolineata, Aprasia, II., 162; *vide* A. pulchella.
Octopus raricyathus, I., 61, 62; *vide* Argonauta oryzata.
oculata, Nellia, I., 49.
Ocythoë raricyathus, I., 61, 62; *vide* Argonauta oryzata.
Odontaspis taurus, I., 64.
Œdipoda musica, II., 110.
Officeri, Rhodona, I., 51.
Oiketicus elongatus, I., 40; *vide* Metura elongata.
,, *Saundersi*, I., 40; *vide* Metura elongata.
Oligorus Macquariensis, I., 85, 86.
olivacea Cicada, I., 50; *vide* Cyclochila Australasiæ.
,, Cyclochila, I., 50; *vide* C. Australasiæ.
Ommastrephes Gouldi, II., 169, 170.
Onchopora hirsuta, I., 49; *vide* Tubucellaria.
Opercula of Retepora aurantiaca, I., 94.
,, ,, avicularis, I., 94.
,, ,, carinata, I., 94.
,, ,, fissa, I., 94.
,, ,, formosa, I., 94.
,, ,, granulata, I., 94.
,, ,, monilifera, I., 94.
,, ,, ,, form munita, var. acutirostris, I., 94.
,, ,, ,, form munita, var. lunata, I., 94.
,, ,, ,, var. sinuata, I., 94.
,, ,, ,, form umbonata, I., 94.
,, ,, Phœnicea, I., 94.
,, ,, porcellana, I., 94.
,, ,, ,, var. laxa, I., 94.
,, ,, serrata, I., 94.
,, ,, tessellata, I., 94.
Opsomala sordida, II., 139.
ornatum, Calpidium, II., 108.
ornithorhynchus, Scrupocellaria, II., 126.
oryzata, Argonauta, I., 61, 62.
Otaria cinerea, I., 31, 71; *vide* Euotaria.

P.

pachnoides, Schizoporella, II., 186.
Painted-Lady Butterfly, Blue-spotted, II., 198.
Palinurus *Edwardsi*, II., 149, 150; *vide* P. Lalandi.
,, Hügeli, II., 159.
,, Lalandi, II., 149, 150.
,, *Paulensis*, II., 149, 150; *vide* P. Lalandi.
,, *tumidus*, II., 159; *vide* P. Hügeli.
Pallasiana, Lepralia, I., 36; *vide* L. *pertusa*.
Paper-Nautilus, Tuberculated Argonaut, or, I., 61, 62.
Papilio Aganippe, I., 10; *vide* Pieris (Thyca).
,, Harpalyce, I., 9; *vide* Pieris (Thyca).
papillifera, *Lepralia*, I., 37; *vide* Porella.
,, Porella, I., 37; *vide Lepralia*.
papulifera, Biflustra, II., 106.
,, *Membranipora*, II., 106; *vide* Biflustra.
Parmularia obliqua, I., 48; *vide Eschara*.
Parrot-fish, Bleeker's, II., 134.
,, Broad-striped, or Senator, II., 163.
Patagonica, Hippothoa, II., 187; *vide* H. divaricata.
patellaria, *Diachoris*, II., 117; *vide* Amphiblestrum patellarium.
,, *Membranipora*, II., 117; *vide* Amphiblestrum patellarium.
,, *Mollia*, II., 117; *vide* Amphiblestrum patellarium.
patellarium, Amphiblestrum, II., 117.
patina, Diastopora, II., 147.
Paulensis, Palinurus, II., 149, 150; *vide* P. Lalandi.
pectinata, Membranipora, II., 127.
Pedestrian Mid-eyed Locust, II., 139.
pedestris, Mesops, II., 139.
Peeli, *Grystes*, I., 85, 86; *vide* Oligorus Macquariensis.
Pelamyd, Melbourne, II., 155.
Pelamys Schlegeli, II., 155.
pellucida, hyalina var., Schizoporella, I., 38; II., 186; *vide* Lepralia.
,, *Lepralia*, hyalina var., I., 38; II., 186; *vide* Schizoporella.
Pentagonaster (Tosia) aurata, II., 200.
Perca marginata, I., 16, 17; *vide* Arripis truttaceus.
,, *trutta*, I., 16, 17; *vide* Arripis truttaceus.
Perch, Banded Red Gurnet-, I., 33.
,, Gippsland, I., 14.
,, Murray Cod-, I., 85, 86.
,, ,, Golden, I., 84.
,, Spotted Red Gurnet-, II., 193.
percoides, *Scorpæna*, I., 33; *vide* Sebastes.
,, Sebastes, I., 33.
perforata, Catenicella, I., 24.
,, *Membranipora*, I., 25, 36; *vide* Micropora.
,, Micropora, I., 25, 36; *vide Membranipora* id.
perfragilis, Biflustra, I., 57.
Periehæta Gippslandica, I., 7.
permunita, *Membranipora*, II., 106; *vide* Amphiblestrum permunitum.
permunitum Amphiblestrum, II., 106.
Peronii, Ibacus, II., 199.
,, Monacanthus, II., 143.
Péron's Ibacus Crab, II., 199.
,, Leather-jacket, II., 143.
(personata, var.) Microporella ciliata, I., 37; II., 175.
,, ,, Microporella Malusii, II., 175; *vide Lepralia*.
pertusa, Lepralia, I., 36; *vide* L. Pallasiana.
Petralia undata, I., 60.
Phalænoides glycine, I., 8; *vide* Agarista.
Phaneroptera (Ephippitytha) trigintiduoguttata, II., 120.
,, valida, II., 119.
Phasma, Red-shouldered, I., 69, 70.
,, Large Pink-winged, I., 80.
Phasma violascens, I., 79; *vide* Acrophylla.
Phasma, Violet-shouldered, I., 69, 70.
,, Violet-winged, I., 79.
Phillipi, *Cestracion*, II., 113; *vide* Heterodontus.
,, Heterodontus, II., 113.
,, *Squalus*, II., 113; *vide* Heterodontus.
Phoca leptonyx, I., 21; *vide* Stenorhynchus.
Phœnicea, Retepora, I., 94, 98.
Phyllopteryx altus, I., 65.
,, foliatus, I., 65.
Phyllurus Milnsii, II., 132.
Physignathus Lesueri, var. Howitti, I., 81.
Picked Dog-Fish, I., 75.
pictus, *Gryllus*, II., 110; *vide* Œdipoda musica.
Pieris (Thyca) Aganippe, I., 10.
,, ,, Harpalyce, I., 9.
Pike, Saury, II., 135.
,, Skipjack, II., 115.
pilosa, Electra, I., 25; *vide Membranipora*.
,, *Flustra*, I., 25; *vide* Electra.
,, *Membranipora*, I., 25; *vide* Electra.
Pink-winged Phasma, Large, I., 80.
pisciformis, Carbasea, I., 45.
plagiostoma, Catenicella, I., 24.
,, ,, var. lævis, I., 24.
,, ,, var. setigera, I., 24.
Plain Whiting, II., 182.
platalea, Adeonella, I., 48; *vide Eschara*.
,, *Cellepora*, II., 148, 168; *vide* Schismopora.
,, *Eschara*, I., 48; *vide* Adeonella.
,, Schismopora, II., 148, 168; *vide Cellepora*.
Platemys, Macquaria, I., 82, 83; *vide* Chelymys.
plumbeus, *Scomber*, II., 183; *vide* Temnodon saltator.
pneumatophorus, Scomber, I., 28.
Podacanthus typhon, I., 80.
Pœcilopora anomala, II., 156.
polita, *Membranipora*, II., 106; *vide* Pyripora.
,, Pyripora, II., 106.
ponderosa, *Catenicella*, II., 107; *vide* Calpidium ponderosum.
ponderosum, Calpidium, II., 107.
porcata, *Dermatochelys*, II., 101; *vide* Sphargis coriacea.
porcellana, Bathypora, II., 106; *vide* B. nitens.
,, *Membranipora*, II., 106; *vide* Bathypora.
porcellana Retepora, I., 94, 95.

porcellana, Retepora, var. laxa, I., 94, 95.
Porella marsupium, I., 35; *vide Lepralia.*
,, papillifera, I., 37; *vide Lepralia.*
Porina gracilis, I., 48; *vide Eschara.*
,, larvalis, I., 37; *vide Lepralia.*
Porina magnirostris, II., 175; *vide* Tessaradoma.
porphyriacus *Coluber*, I., 1; *vide* Pseudechys.
,, Pseudechys, I., 1.
Port Jackson, or Bull-dog Shark, II., 103.
Potamobius serratus, I., 15; *vide* Astacopsis.
prælonga, Cyclicopora, II., 116; *vide* C. longipora.
Pristiophorus nudipinnis, I., 56.
profunda, Rhynchopora, II., 196; *vide* R. longirostris.
prolifera, Cellepora, II., 166, 168.
pronged Toad-fish, Two-, II., 123.
Pseudechys Australis, II., 142.
,, Snake, Brown, II., 142.
,, porphyriacus, I., 1.
Pseudocarcinus gigas, II., 179, 180.
Pseudodelma impar, II., 162.
Pseudoelaps superciliosus, I., 23; *vide* Diemenia superciliosa.
Pseudophysis barbatus, I., 20.
pulchella, Aprasia, II., 162.
,, Catenicella, I., 89.
pulcherrima, Schizoporella, II., 186.
pulchra, Claviporella, II., 146.
punctigera, Schizoporella, II., 138.
punctigerum, Amphiblestrum, II., 106.
punctulata, Lialis, II., 161; *vide* L. Burtoni.
purpurisatus, Aulopus, I., 54, 55.
pusilla, Catenicellopsis, II., 107.
pygmæa, Flosculipora, II., 176.
Pygopus lepidopus, II., 152, 153.
,, Lizard, II., 152, 153.
,, *squamiceps*, II., 152, 153; *vide* P. lepidopus.
Pyrameis Kershawi, II. 198.
,, Itea, II., 198.
pyriformis, Bracebridgia, II., 158.
,, *Mucronella*, II., 158; *vide* Bracebridgia.
Pyripora catenularia, II., 106.
,, crassa, II., 106.
,, polita, II., 106.
pyrula, Membranipora, I., 26; II., 127; *vide* M. *lineata.*

Q.

quadrata, *Eschara*, I., 48; *vide* Lepralia.
,, Lepralia, I., 48; *vide Eschara.*
Quoy's Hinulia Lizard, II., 191.
Quoyi, Hinulia, II., 191.
,, *Lygosoma*, II., 191; *vide* Hinulia.

R.

radians, Idmonea, I., 68.
radiata, Cribrilina, II., 187.
radicifera, Beania, II., 117.
,, *Membranipora*, II., 117; *vide* Beania.
ramosa, Fasciculipora, II., 157.
Rana aurea, I., 53; *vide* Ranoidea.
Ranoidea aurea, I., 53.
,, *Jacksoniensis*, I., 53; *vide* R. aurea.
raricyathus, Octopus, I., 61, 62; *vide* Argonauta oryzata.
,, *Ocythoë*, I., 61, 62; *vide* Argonaut oryzata.
Ray, Eagle-, Blue-spotted, I., 63.
Rayi, Brama, II., 133.
Ray's Sea-Bream, II., 133.
recta, Itea, II., 178.
Red Gurnet-Perch, Banded, I., 33.
,, ,, ,, Spotted, II., 193.
Red King Crab, Great, II., 179, 180.
Red-shouldered Phasma, I., 69, 70.
Regalecus Banksi, II., 145.
,, *Glesne*, II., 145; *vide* R. Banksi.
renipuncta, Microporella, II., 175.
Retepora aurantiaca, I., 94, 98.
,, avicularis, I., 94, 95.
,, carinata, I., 94, 97.
,, fissa, I., 94, 95.
,, formosa, I., 94, 97.
,, grannlata, I., 94, 99.
,, laxa (var.), porcellana, I., 94, 95.
,, *marsupiata* (?), I., 94, 95; *vide* R. fissa.
,, monilifera, I., 94, 96, 97.
,, ,, form munita, var. acutirostris, I., 94, 96.
,, ,, form munita, var. lunata, I., 94, 96.
,, ,, var. sinuata, I., 94, 96.
,, ,, form umbonata, I., 94, 97.
,, Phœnicea, I., 94, 98.
,, porcellana, I., 94, 95.
,, ,, var. laxa, I., 94, 95.
,, *robusta*, I., 94, 95; *vide* R. porcellana.
,, ,, I., 94, 95; *vide* R. porcellana, var. laxa.
,, serrata, I., 94, 99.
,, tessellata, I., 94, 99.
,, (umbonata, form) monilifera, I., 94, 97.
reticulata, Acripeza, II., 129.
Retihornera foliacea, II., 118; *vide* Hornera.
Rhabdozoum Wilsoni, II., 178.
Rhina squatina, I., 34.
rhodomus, Tropidoderus, I., 69, 70.
Rhodona Officeri, I., 51.
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Rhynchopora bispinosa, II., 196.
,, longirostris, II., 196.
,, *profunda*, II., 196; *vide* R. longirostris.
Ribbon-fish, Southern Silver, II., 122.
Ridleyi, Schizoporella, II., 138.
rigida, Cellaria, II., 105.
Ringed Snake, Black- and White-, I., 52.
ringens, Catenicella, II., 178.
River Tortoise, Long-necked, I., 92, 93.
roborata, *Membranipora*, II., 177; *vide* Craspedozoum roboratum.
roboratum, Craspedozoum, II., 177; *vide Membranipora roborata.*
robusta, Bugula, I, 78.
,, Hornera, II., 118.
robusta, Retepora, I., 94, 95; *vide* R. porcellana, and var. laxa.
Rock Cod, Australian, I., 20.

Rock Cod, Small-scaled, I., 19.
Rockling, Australian, I., 27.
Rock Lobster, Southern, II., 149, 150.
Rondeletii, Carcharodon, I., 74.
roseipennis, Diura, I., 79; *vide* Acrophylla violascens.
Rosselii, Membranipora, I., 26; *vide* Amphiblestrum bursarium.
rostrata, Schizoporella, II., 186.
rota, *Cellepora*, II., 148; *vide* Schismopora.
,, Schismopora, II., 148; *vide Cellepora.*
Rough Fish, Australian, II., 114.
Roughy, II., 184.
rudis, Caberea, II., 136.
rufa, Catenicella, I., 24.
Rugged Stump-tail, or Shingle-back Lizard, II., 102.
rugosus, Trachydosaurus, II., 102.
Rüppelli, Typhlops, II., 103; *vide* T. nigrescens.

S.

salar, Centropristes, I., 16, 17; *vide* Arripis truttaceus.
Salicornaria farciminoides, I., 49; *vide* Cellaria (*fistulosa*) Australis.
,, gracilis, I., 49; *vide* Cellaria.
,, hirsuta, I., 49; *vide* Cellaria.
,, *simplex*, II., 105; *vide* Cellaria rigida.
,, tenuirostris, I., 49; *vide* Cellaria.
Salmon Arripis, I., 16, 17.
,, Trout, I., 16, 17.
saltator, Temnodon, II., 183.
saltatrix, Gasterosteus, II., 183; *vide* Temnodon saltator.
Sand-Frog, Common, I., 42.
Sarniensis, Diastopora, II., 147.
Saturnia Laplacei, II., 197; *vide* Chelepteryx Collesi.
Saunders' Case-Moth, I., 40.
Saundersi, Oiketicus, I., 40; *vide* Metura elongata.
saurus, *Esox*, II., 135; *vide* Scomberesox saurus, var. Forsteri.
,, Scomberesox, var. Forsteri, II., 135.
Saury Pike, II., 135.
Saw-Fish, Common Australian, I., 56.
scandens, Microporella, II., 175.
scaled, Small-, Rock Cod, I., 19.
Schismopora benemunita, II., 148, 168; *vide Cellepora.*
,, costata, II., 148, 168; *vide Cellepora.*
,, Costazei, var., II., 148; *vide Cellepora.*
,, glomerata, II., 148, 168; *vide Cellepora.*
,, megasoma, I., 38; II., 148, 168; *vide Cellepora.*
,, platalea, II., 148, 168; *vide Cellepora.*
,, rota, II., 148; *vide Cellepora.*
,, tiara, II., 148, 168; *vide Cellepora.*
,, vitrea, I., 38; II., 148, 168; *vide Cellepora.*
Schizoporella arachnoides, II., 138.
,, biturrita, II., 186.
,, Botryoides, I., 38; *vide Lepralia.*
,, Cecilii, I., 35; *vide Lepralia.*
,, circinata, I., 35; *vide Lepralia.*
,, *controversa*, II ,138; *vide* S. dædala.
,, cryptostoma, II., 138.
,, dædala, II., 138.
,, hyalina, var. pellucida, I., 38; II., 186; *vide Lepralia* hyalina.
,, ,, var. cornuta, II., 186.
,, ,, var. incrassata, II, 186.
,, ,, tuberculata, II., 186.
,, lata, II., 138.
,, latisinuata, II., 186.
,, Maplestonei, I., 35; *vide Lepralia.*
,, *marsupium*, II., 138; *vide* S. Ridleyi.
,, pachnoides, II., 186.
,, (pellucida, var.) hyalina, I., 38; II., 186.
,, pulcherrima, II., 186.
,, punctigera, II., 138.
,, Ridleyi, II., 138.
,, rostrata, II., 186.
,, schizostoma I., 38; *vide Lepralia.*
,, subimmersa, I., 35; *vide Lepralia.*
,, subsinuata, II., 138.
,, triangula, II., 138.
,, Woosteri, II., 186.
schizostoma, *Lepralia*, I., 38; *vide* Schizoporella.
,, Schizoporella, I., 38; *vide Lepralia.*
Schlegeli, Pelamys, II., 155.
Scincus nigroluteus, II., 131; *vide* Cyclodus.
,, gigas, I., 72; *vide* Cyclodus.
,, *Whitei*, II., 191; *vide* Hinulia.
Scomber Commersoni, II., 154; *vide* Cybium.
Scomberesox *Camperi*, II., 135; *vide* S. saurus, var. Forsteri.
,, Forsteri (?), II., 135; *vide* S. saurus, var. Forsteri.
,, saurus, var. Forsteri, II., 135.
Scomber plumbeus, II., 183; *vide* Temnodon saltator.
Scomber pneumatophorus, I., 28.
Scomber thynnus, I., 44; *vide* Thynnus.
,, trachurus, I., 18; *vide* Trachurus trachurus.
Scorpæna percoides, I., 33; *vide* Sebastes id.
scorpænoides, Neosebastes, II., 193.
Scruparia chelata, II., 178.
scrupea, Scrupocellaria, II., 126.
Scrupocellaria cervicornis, II., 126.
,, cyclostoma, II., 126.
,, obtecta, II., 126.
,, ornithorhynchus, II., 126.
,, scrupea, II., 126.
Sea-Bear or Fur-Seal, I., 31, 71.
Sea Bream, Ray's, II., 133.
Sea-Dragon, Leafy, I., 65.
Sea Gar-fish, Black-finned Half-beak, or, II., 135.
Sea-Horse, Short-headed, I., 65.
,, Leopard Seal, I., 21.
Seal, Fur-, Sea-Bear or, I., 31, 71.
,, Sea-Leopard, I., 21.

Sebastes percoides, I., 33.
Selache maxima, II., 104; *vide* Cetorhinus maximus
Senator Parrot-fish, Broad-striped, or, II., 163.
Sepia apama, II., 188, 189, 190.
,, or Cuttle-fish, Large Melbourne, II., 188, 189, 190.
Sepioteuthis Australis, I., 76, 77.
Sergeant Baker, I., 54, 55.
Serialaria Australis, II., 185; *vide* Amathia.
,, *spiralis*, II., 185; *vide* Amathia bicornis.
Seriola *aureo-rittata*, II., 172; *vide* S. Lalandi.
,, *grandis*, II., 172; *vide* S. Lalandi.
,, Lalandi, II., 172.
serrata, Membranipora, II., 127.
,, Retepora, I., 94, 99.
serratirostris, Cellepora, II., 128, 168.
serratus, *Astacoides*, I., 15; *vide* Astacopsis.
,, Astacopsis, var. Yarraensis, II., 160.
,, *Cancer*, I., 15; *vide* Astacopsis.
,, *Potamobius*, I., 15; *vide* Astacopsis.
setigera, Catenicella, var., I., 24; *vide* C. plagiostoma.
setirostris, Cribrilina, II., 187.
setosa, Crisia, I., 39.
Seven-gilled Shark, I., 43.
Shark, Australian Tope, I., 64.
,, Basking, II., 104.
,, Bull-dog, or Port Jackson, II., 113.
,, Bull-, Long-toothed, I., 64.
,, Carpet, I., 43.
,, Hammer-headed, I., 56.
,, Long-tailed, or Thresher, I., 88.
,, Port Jackson, or Bull-dog, II., 113.
,, Seven-gilled, I., 43.
,, Shovel-nosed Bull-, I., 64.
,, Spinous, II., 144.
,, Thresher, or Long-tailed, I., 88.
,, Tope, Australian, I., 64.
,, White, I., 74.
Sharvianus, Cetorhinus, II., 104; *vide* C. maximus.
Shield-fronted Brown Snake, I., 23.
Shield Star, Twelve-plated, II., 200.
Shingle-back, or Rugged Stump-tail, Lizard, II., 102
Short-headed Sea-Horse, I., 65.
Shovel-nosed Shark, or Long-toothed Bull-Shark, I., 64.
Sillago ciliata, II.. 182.
Silver Ribbon-fish, Southern, II., 122.
simplex, Cellepora, II., 165, 168.
,, *Crenidens*, I., 73; *vide* Girella.
,, Didymia, I. 46.
,, Farciminaria, II., 158.
,, Girella, I., 73.
simplex, *Salicornaria*, II., 105; *vide* Cellaria rigida.
sincoides, *Lacerta*, I., 72; *vide* Cyclodus gigas.
sinuata (var.), Retepora monilifera, I., 94, 96.
Skipjack, II., 183.
Skipjack Pike, II., 115.
Sleepy Lizard, Northern Blue-tongue, or, I., 72.
,, ,, Southern, or Blotched Blue-tongue, II., 131.
Smaller Green Gum-tree Grasshopper, II., 119.
Small-scaled Brown Snake, I., 23.
,, Rock Cod, I., 19.
Smooth-Hound, Australian, I., 87.
Snake, Black, I., 1.
,, Black- and White-Ringed, I., 52.
,, Blackish Australian Worm-, II., 103.
,, Brown, Common, I., 23.
,, ,, Shield-fronted, I., 23.
,, Brown, Small-scaled, I., 23.
,, Carpet, I., 13.
,, Common Brown, I., 23.
,, Copper-head, I., 2.
,, Furina-, Two-hooded, I., 32.
,, Little Whip-, I., 11.
,, Pseudechys, Brown, II., 142.
,, Shield-fronted Brown, I.. 23.
,, Small-scaled Brown, I., 23.
,, Tiger, I., 3.
,, Two-hooded Furina-, I., 32.
,, Whip-, Little, I., 11.
,, White-lipped, I., 11.
,, Worm-, Blackish Australian, II., 103.
sordida, Opsomala, II., 139.
Southern, or Blotched, Blue-tongue Lizard, II., 131.
,, Chimæra, II., 112.
,, Mackerel, I., 28.
,, Rock Lobster, II., 149, 150.
,, Silver Ribbon-fish, II., 122.
,, Spiny Lobster, II., 149, 150.
speciosa, Cellepora, II., 128.
Sphargis coriacea, II., 101.
,, *mercurialis*, II., 101; *vide* S. coriacea.
,, *mercurii*, II., 101; *vide* S. coriacea.
,, *tuberculata*, II., 101; *vide* S. coriacea.
spicata, Cellepora, II., 165, 168.
,, Dimetopia, I., 46.
(spicata, var.) ciliata, Microporella, I., 37; II., 175; *vide Lepralia*.
spicatum, Craspedozoum, II., 177.
spinifer, Astacoides, I., 15; *vide* A. serratus.
spinigera, Beania, I.. 46; *vide Diachoris*.
,, *Diachoris*, I., 46; *vide* Beania.
spinosa, Membranipora, II., 127.
spinosus, Echinorhinus, II., 144.
,, *Squalus*, II., 144; *vide* Echinorhinus.
Spinous Shark, II., 144.
,, Lobster, Southern, II., 149, 150.
Spiny Cray-fish, Yarra, II., 160.
,, Lobster, Southern, or Melbourne Crawfish, II., 149, 150.
,, ,, Sydney (Sydney Craw-fish), II., 159.
,, Ridged Lizard, II., 141.
,, Sided Butterfly-Gurnard, I., 5.
Spiralaria florea, I., 46.
spiralis, Amathia, II., 185.
spiralis, *Serialaria*, II., 185; *vide* Amathia bicornis.
Spotted Eagle-Ray, Blue-, I., 63.
,, Grasshopper, Thirty-two, II., 120.
,, Marsh-Frog, I., 42.
,, Painted-Lady Butterfly, Blue-, II, 198.
,, Red Gurnet-Perch, II., 193.
Squalus acanthias, I., 75; *vide* Acanthias vulgaris.
,, *appendiculatus*, I., 43; *vide* Crossorhinus barbatus.
,, barbatus, I., 43; *vide* Crossorhinus.

Squalus lobatus, I., 43; *vide* Crossorhinus barbatus.
,, maximus, II., 104; *vide* Cetorhinus.
,, Phillipi, II., 113; *vide* Heterodontus.
,, spinosus, II., 144; *vide* Echinorhinus.
,, squatina, I., 34; *vide* Rhina.
,, vulpes, I., 88; *vide* Alopecias.
,, *zygæna*, I., 56; *vide* Zygæna malleus.
squamiceps, Pygopus, II., 152, 153; *vide* P. lepidopus.
squatina, Rhina, I., 34.
,, *Squalus*, I., 34; *vide* Rhina.
Squid, Gould's, II., 169, 170.
Star-fish, Eight-rayed Cushion, II., 200.
,, Gunn's Cushion, II., 200.
,, Twelve-plated Shield, II., 200.
Steganoporella *elegans*, I., 60; *vide* S. magnilabris.
Steganoporella Jervoisii, II., 196; *vide* Thairopora.
Steganoporella magnilabris, I., 60.
stellata, Escharipora, II., 175.
,, *Microporella*, II., 175; *vide* Escharipora.
Stenorhynchus leptonyx, I., 21.
Stirparia annulata, I., 59.
,, glabra, II., 195.
Stomatopora gemiuata, II., 176.
Streaked Earless Lizard, White-, II., 181.
striatula, Gemellipora, II., 138.
,, *Lepralia*, II., 138; *vide* Gemellipora.
Striped Parrot-fish, Broad-, or Senator, II., 163.
Stump-tail, or Shingle-back Lizard, Rugged, II., 102.
subimmersa, *Lepralia*, I., 35; *vide* Schizoporella.
,, Schizoporella, I., 35; *vide Lepralia*.
subsinuata, Schizoporella, II., 138.
superbus, Hoplocephalus, I., 2.
superciliosa, Diemenia, I., 23.
superciliosus, *Pseudoclaps*, I., 23; *vide* Diemenia superciliosa.
Sydney Craw-fish or Spiny Lobster, II., 159.
Syngnathus foliatus, I., 65; *vide* Phyllopteryx.
,, *tæniolatus*, I., 65; *vide* Phyllopteryx foliatus.

T.

tænia, Trachypterus, II., 122.
tæniolatus, Syngnathus, I., 65; *vide* Phyllopteryx foliatus.
Tasmanicus, *Centropristes*, I., 16, 17; *vide* Arripis truttaceus.
Tasmanicus, Callorhynchus, II., 112; *vide* C. Antarcticus.
Tasmaniensis, Limnodynastes, I., 42.
taurus, *Carcharias*, I., 64; *vide* Odontaspis.
,, Odontaspis, I., 64.
Temnodon *heptacanthus*, II., 183; *vide* T. saltator.
,, saltator, II., 183.
tenuirostris, Cellaria, I., 49.
,, *Salicornaria*, I., 49; *vide* Cellaria.
tenuis, Canda, II., 136.
,, Crisia, I., 39.
Tessaradoma magnirostris, II., 175.
tessellata, Retepora, I., 94, 99.
Testudo coriacea, II., 101; *vide* Sphargis.
Testudo longicollis, I., 92, 93; *vide* Chelodina.
,, *Lyra*, II., 101; *vide* Sphargis coriacea.
Tettigonia Australasiæ, I., 50; *vide* Cyclochila.
Thairopora armata, II., 196.
,, dispar, I., 26; *vide Membranipora*.
,, Jervoisii, II., 196.
,, mamillaris, I., 25; II., 196; *vide Membranipora*.
,, Woodsii, I., 26; *vide Membranipora*.
Thersites *altivelis*, I., 44; *vide* T. atun.
,, atun, I., 44.
Thick-tailed Gecko, II., 132.
Thirty-two Spotted Grasshopper, II., 120.
Thresher or Long-tailed Shark, I., 88.
(Thyca) Pieris Aganippe, I., 10.
,, ,, Harpalyce, I., 9.
Thynnus *Maccoyi*, I., 44; *vide* T. thynnus.
,, *Scomber*, I., 44; *vide* Thynnus.
,, thynnus, I., 44.
,, *vulgaris*, I., 44; T. thynnus.
(thyreophora, var.), Malusii, Microporella, II., 175; *vide Lepralia*.
tiara, *Cellepora*, II., 148. 168; *vide* Schismopora.
,, Schismopora, II., 148, 168; *vide Cellepora*.
tigerinus, Genypterus, I., 27; *vide* G. Australis.
Tiger Snake, I., 3.
Tiliqua leucopsis, II., 191; *vide* Hinulia Whitei.
Toad-fish, Two-pronged, II., 123.
Tooth-brush Leather-jacket, Brown's, II., 124.
Tooth-cupped Cuttlefish, I., 76, 77.
Tope Shark, Australian, I., 64.
Tortoise, Long-necked River, I., 92, 93.
,, Murray, I. 82, 83.
tortuosa, Amathia, II., 185.
(Tosia) Pentagonaster aurata, II., 200.
Trachichthys Australis, II., 114.
Trachinops, Blotch-tailed, II., 194.
,, caudimaculatus, II., 194.
trachurus, *Caranx*, I., 18; *vide* Trachurus trachurus.
,, *Scomber*, I., 18; *vide* Trachurus trachurus.
Trachurus trachurus, I., 18.
Trachydosaurus rugosus, II., 102.
Trachypterus *falx*, II., 122; *vide* T. tænia.
,, *iris*, (?) II., 122; *vide* T. tænia.
,, tænia, II., 122.
triangula, Schizoporella, II., 138.
tricellata, Menipea, I., 58.
tricuspis, Mucronella, II., 116.
tridenticulata, Cellepora, II., 128.
trifolium, Amphiblestrum, I., 37; *vide Lepralia*.
,, *Lepralia*, I., 37; *vide* Amphiblestrum.
trigintiduoguttata, Phaneroptera (Ephippitytha), II., 120.
Trigla kumu, I., 6.
Tropidoderus iodomus. I., 69, 70.
,, rhodomus, I., 69, 70.
Tropinotus Australis, II., 140.
,, *cinnamonicus*, II., 140; *vide* T. Australis.
Trout, Salmon, I., 16, 17.
trutta, *Perca*, I., 16, 17; *vide* Arripis truttaceus.
truttaceus, Arripis, I., 16, 17.
,, *Centropristes*, I., 16, 17; *vide* Arripis.
tuba, Bicellaria, I., 59.
tubaria, *Cidarites*, I., 100; *vide* Goniocidaris.

tubaria, Goniocidaris, I., 100.
tuberculata, Argonauta, I., 61, 62; *vide* A. oryzata.
tuberculata, Lagenipora, II., 156.
,, var., Schizoporella, II., 186; *vide* S. hyalina.
tuberculata, Sphargis, II,, 101; *vide* S. coriacea.
Tuberculated Argonaut, or Paper Nautilus, I., 61, 62.
tuberculosa, Argonauta, I., 61, 62; *vide* A. oryzata.
Tubucellaria cercoides, II., 105.
,, hirsuta, I., 49.
tumidus, Palinurus, II., 159; *vide* P. Hügeli.
Tunny, I., 44.
turbinata, Bicellaria, I., 59.
Turtle, Leathery, or Luth, II., 101.
Twelve-plated Shield Star, II., 200.
Two-hooded Furina-Snake, I., 32.
Two-pronged Toad-fish, II., 123.
Tympanocryptis lineata, II., 181.
Typhlops nigrescens, II., 103.
,, *Rüppelli*, II., 103; *vide* T. nigrescens.
typhon, Podacanthus, I., 80.

U.

umbonatum, Amphiblestrum, I., 25; *vide Membranipora umbonata.*
umbonata, Catenicella, I., 90.
umbonata, *Membranipora*, I., 25; *vide* Amphiblestrum umbonatum.
,, (form) Retepora monilifera, I., 94, 97.
uncinata, Farciminaria, II., 158.
undata, Petralia, I., 60.
Urceolipora dentata, II., 105.
,; nana, II., 105.
urnula, Catenicella, II., 146.
utriculus, Catenicella, I., 89.

V.

valida, Phaneroptera, II., 119.
Vanessa, Lepidotrigla, I., 5.
variabilis, *Aluterius*, II., 125; *vide* Monacanthus hippocrepis.
varia, *Lacerta*, I., 41; *vide* Hydrosaurus varius.
variegata, Morelia, I., 13.
varius, Hydrosaurus, I., 41.
,, Yellow-sided Dolphin, I., 21.
ventricosa, Catenicella, I., 24.
venusta, Catenicella, II., 146.
Vermicella annulata, I., 52.
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ADDENDA ET CORRIGENDA.

PLATE 7.—My friend Professor Spencer, in publishing a paper on the anatomy of *Megascolides*, says I have referred it to the wrong Family. As he did not state what was the right Family, I made inquiry and found he had taken Perrier's artificial divisions of Earth-worms (into those having the male genital openings in front of, upon, or behind the clitellum) for Families. Some of the Family *Lumbricidæ* have these openings in one relative position and some in the other; the *one* artificial character not outweighing the many structural characters indicating the Family.

PLATES 15, 29, 160.—For *Astacoides*, read *Astacopsis*.

PLATES 16–17.—References:—For ? Perca trutta (Cuv. and Val.), Hist. Nat. des Poiss., v. 4, p. 54, read vol. 2; add Perca marginata (Cuv. and Val.), Hist. Nat. des Poiss., v. 2., p. 53.

PLATE 42.—For *Lymnodynastes*, read *Limnodynastes*.

PLATE 51.—*Rhodona Officeri* is referred to *R. punctata vittatum* (Günth.), of Queensland, by Mr. Boulenger, but the description in the Ann. and Mag. of Nat. Hist. for July, 1867, differs in several particulars.

PLATE 87.—Explanation of Figures:—Fig. 2, side view of snout, &c., should be: side view of female, &c. Figs. 1*c* and 1*d* should be Figs. 2*c* and 2*d*.

PLATE 109.—Footnote:—For large antennæ, read inner antennæ.

PLATE 112.—In last line of Reference:—For page 696, read page 174.

PLATE 122.—For *Trachypterus tænia* read *T. tænia*.

PLATE 139.—(*Mesops pedestris*). Add Reference: *Erichson*, Wiegmann Archiv für Naturgeschicte, 1842, p. 250, t. 5. f. 10.

PLATES 161–2.—The numbers at corners of these plates have been accidentally transposed. That marked 161 should be 162.

PLATE 187.—For Figs. 1–3 read Figs. 1–2.

NOTE FROM MR. MACGILLIVRAY ON CHANGES IN NOMENCLATURE OF POLYZOA ADOPTED IN THE ALPHABETICAL INDEX.

IT has become necessary to alter the generic positions of a considerable number of species, mostly described in the earlier Decades, in consequence of the dismemberment of the old genera *Membranipora*, *Lepralia*, *Eschara*, and one or two others. Definitions of the new genera, with some remarks on the characters which are now considered of chief importance in the systematic arrangement of the Polyzoa, will be found in my Catalogue, printed in the Transactions of the Royal Society of Victoria for 1886.

The alterations indicated are:—*Membranipora pilosa*, to be included in *Electra*, Lamx.; *M. ciliata*, *umbonata*, *cervicornis*, and *Lepralia trifolium* in *Amphiblestrum*, Gray; *M. mamillaris*, *dispar*, and *Woodsii*, in *Thairopora*, McG.; *M. perforata* in *Micropora*, Hincks; *Lepralia monoceros* in *Cribrilina*, Gray; *L. ferox* in *Hiantopora*, McG.; *L. Malusii*, *ciliata*, *diadema*, and *canaliculata*, in *Microporella*, Hincks, the last as a variety of *diadema*; *Eschara mucronata* in *Adeonellopsis*, McG.; *L. circinata*, *Cecilii*, *submmersa*, *Maplestonei*, *vitrea*, *schizostoma*, *botryoides*, and *pellucida*, in *Schizoporella*, Hincks, *pellucida* as a variety of *hyalina*; *Eschara obliqua* in *Parmularia*, Busk, MSS.; *Eschara quadrata* in *Lepralia*; *L. vittata* and *Brogniartii* in *Chorizopora*, Hincks; *L. marsupium* and *papillifera* in *Porella*, Gray; *Eschara dispar* and *platalea* in *Adeonella*, Busk; *L. larvalis* and *Eschara gracilis* in *Porina*, d'Orb.; *L. diaphana*, *Ellerii*, and *excavata*, in *Mucronella*, Hincks.

Besides these alterations, *Catenicella aurita* and *geminata* are to be referred to *Clariporella*, McG.; *Catenicellopsis delicatula* to *Catenicella*; *Diachoris magellanica* and *spinigera* to *Beania*, as I cannot see any sufficient distinction between these genera. *Carbasea episcopalis* is included in the genus *Euthyris*, Hincks. *Dictyopora* differs from *Adeona* only in the fenestration of the zoarium, a character which, although valid when the genus was proposed, cannot now be considered of sufficient importance for the foundation of a genus; the species must therefore go with *Adeona*. *Cellepora (Lepralia)*, *megasoma*, *costata*, *rota*, *costazei*, *platalea*, *vitrea*, *benemunita*, *glomerata*, *tiara*, have been separated from *Cellepora* to form the genus *Schismopora*, McG.

Chlidonia dædala proves to be, as suggested in my description, in no way different from the European *C. Cordieri*, And. sp. *Cellaria fistulosa*, var. *Australis*, must rank as a separate species. *Membranipora lineata* is not that species, but *M. pyrula*, Hincks; so also *M. Rossellii* must be altered to *Amphiblestrum bursarium*, McG. I doubt *M. Lacroixii* being identical with the European species. *Lepralia pertusa* should be *L. Pallasiana*, Moll. *Retepora porcellana*, var. *laxa*, has since been described in the "Challenger" Memoir as *R. producta*, Busk. *Bathypora porcellana* was previously described by Hincks as *Membranipora nitens*, and his specific name must consequently be adopted.

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N.B.—The originals of all the Figures are in the National Museum, Melbourne.

PLATE 191.—White's Hinulia Lizard (Hinulia Whitei, Lacép. sp.).—Quoy's Hinulia Lizard (Hinulia Quoyi, Dum. and Bib.).

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